REVISION OF THE NOMINATE SUBGENUS SCELIPHRON LATREILLE (HYM., SPHECIDAE)

(STUDIES ON THE SCELIPHRONINI, PART I)

by

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ABSTRACT

This first part of a revision of the sphecid genus *Sceliphron* sensu Kohl (1918) deals with 18 species, arranged in two species groups; the third group of *Sceliphron* s. str. as now restricted by the exclusion of *Chalybion* Dahlbom and *Hemichalybion* Kohl is raised to subgeneric rank (*Prosceliphron* van der Vecht, subg. nov.; type species *Sc. coromandelicum* (Lep.)). The paper is to be regarded as a supplement of Kohl's revision; it contains keys to the species and subspecies, detailed information on some previously overlooked characters and accounts and maps of the distribution. The confused synonymy of the two African species of the *madraspatanum*-group is unravelled. The Cuban species *Sc. argentifrons* (Cress.) is regarded as different from *Sc. fasciatum* (Lep.) inhabiting Hispaniola and Guadeloupe; *Sc. lucae* (Sauss.) is treated as a subspecies of *Sc. jamaicense* (F.). Three new subspecies are described: *Sc. madraspatanum formosanum* van der Vecht, *Sc. javanum chinense* van Breugel, and *Sc. laetum maindroni* van der Vecht.

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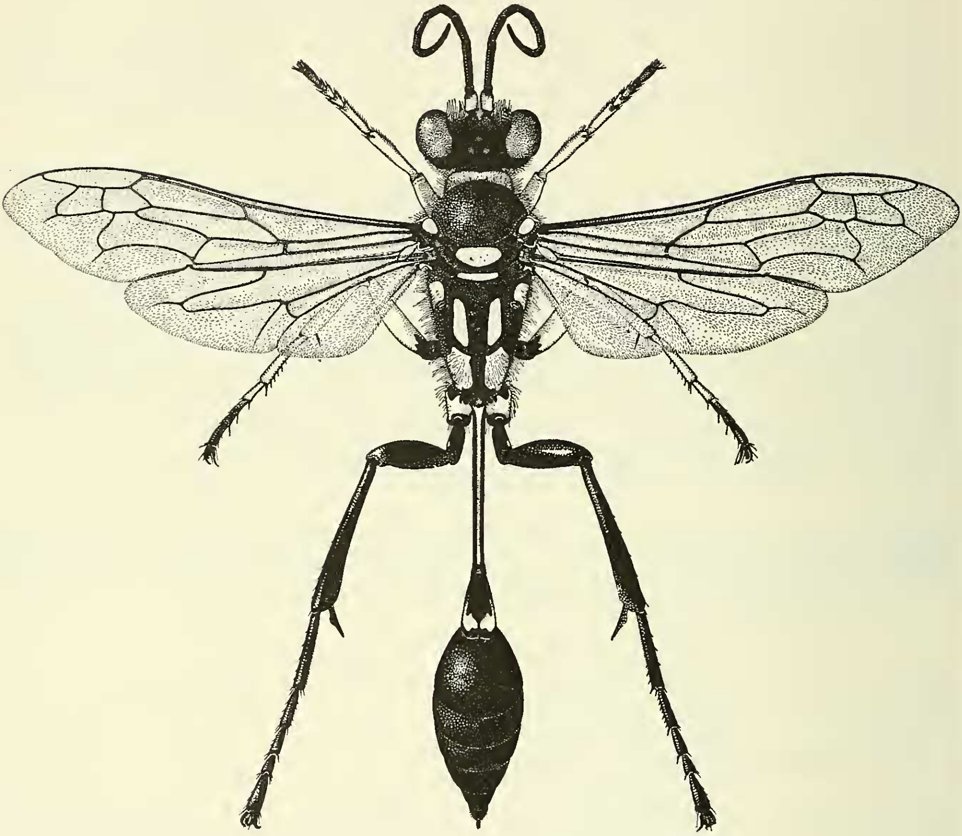


Fig. 1. *Sceliphron* (*Sceliphron*) *fistularium* (Dahlb.), ♀ (Suriname, Kayser Airstrip) (3.7 ×)

INTRODUCTION

This paper deals with two groups of wasps which have been called the "*madraspatanum*-group" and the "*spirifex*-group" in a preliminary communication by the senior author (Van der Vecht, 1961). The most recent revision of these insects is to be found in Kohl's monograph "Die natürliche Gattung *Sceliphron* Klug", published exactly fifty years ago. In this work the species discussed below were treated by Kohl as members of a subgenus *Pelopoeus* Latreille (correctly called *Sceliphron* s. str.), together with a number of species which in 1961 were placed in the "*coromandelicum*-group" and for which now a subgenus is erected. The genus *Sceliphron* sensu Kohl also included the subgenera *Chalybion* Dahlbom and *Hemichalybion* Kohl, which are now regarded as separate genera. The senior author hopes to revise these latter taxa in the near future.

Although Kohl's work is now out of date, it is still a valuable tool for the study of these wasps. As its main shortcomings we may mention: (1) Kohl's material of the Indo-Australian species was rather incomplete, (2) he paid insufficient attention to the relationship of the species and to the geographic variation within some of the species, and (3) he underestimated the taxonomic value of certain characters, particularly the structure of the terminal sternite and the genitalia of the male (Kohl, 1918: 8, wrote: "die Genitalklappen der Sceliphrone weisen keine artliche Mannigfaltigkeit auf und dürften bei der Artunterscheidung kaum je von Wert sein"). In the present paper we have therefore paid special attention to these subjects. Furthermore we found it necessary to change the status of a few forms treated by Kohl as distinct species, to correct some errors in the identification of species described by previous authors, and to present the available information on the distribution of the species and subspecies in a more convenient manner. Yet our work is to be regarded as a supplement to Kohl's monograph, and the two revisions should therefore be used together.

It is of interest to note that since the publication of Kohl's work no new species of the subgenus *Sceliphron* have been discovered. Since only one of the species is really rare in collections and exclusively known in the female sex, and since most of the species are more or less widely distributed and rather conspicuous insects, the discovery of additional species seems very unlikely. And although it is true that some parts of the world have not yet been sufficiently explored in this respect, it is evident that our knowledge of the distribution is sufficiently complete to serve as a firm base for conclusions on the zoogeography of this group. It is particularly for this reason that we have attempted to summarize the available data on distribution in some maps.

Since the appearance of Kohl's revision, some of the species discussed below have been dealt with in studies on a regional basis. Thus Porter (1926) published a paper on the American species of the genus *Sceliphron* (s. str.), and Bohart and Menke treated the North American species in their valuable reclassification of the Sphecinae (1963). Arnold (1928) discussed the African species in his well-known monograph of the Sphecoidea of South Africa; in 1955 Leclercq summarized our knowledge of the species of this region in an important study of the African Sphecinae. These papers should be consulted for additional information on the American and African species.

As we have now studied extensive collections from the Indo-Australian area, it seems to us that particularly further collecting in southwestern Asia is likely to yield important results. In any case it is here that the unknown male of *Sceliphron pietschmanni* Kohl will eventually be discovered. With regard to the bionomics of the various species, important work on such topics as nest construction, prey selection, parasites, etc. is still to be done in many areas. It is intended to discuss this subject in a future paper in this series.

The material used for this study is preserved in the collections of the following museums and private entomologists.

AMNH = American Museum of Natural History, New York, U.S.A.
BISH = Bernice P. Bishop Museum, Honolulu, Hawaii, U.S.A.
BM = British Museum (Natural History), London, England.
BPI = Bureau of Plant Industry, Manila, Philippines.
CAS = California Academy of Sciences, San Francisco, Calif., U.S.A.
CNHM = Chicago Natural History Museum, Chicago, Ill., U.S.A.
CU = Cornell University, Dept. of Entomology, Ithaca, N.Y., U.S.A.
DEI = Deutsches Entomologisches Institut, Eberswalde, East Germany.
IRSNB = Institut Royal des Sciences Naturelles, Brussels, Belgium.
KU = University of Kansas, Lawrence, Kans., U.S.A.
KVK = coll. Dr. Karl V. Krombein, c/o U.S. National Museum, Washington D.C., U.S.A.
LAM = Los Angeles County Museum, Los Angeles, Calif., U.S.A.
MBUD = Hungarian Natural History Museum, Budapest, Hungary.
MCG = Museo Civico di Storia Naturale, Genova, Italy.
MCZ = Museum of Comparative Zoology, Cambridge, Mass., U.S.A.
MHNG = Musée d'Histoire Naturelle, Geneva, Switzerland.
ML = Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands.
MP = Muséum National d'Histoire Naturelle, Paris, France.
MR = Natuurhistorisch Museum, Rotterdam, Netherlands.
MT = Museo di Zoologia della Università, Torino, Italy.
MZB = Museum Zoologicum, Bogor, Indonesia.
NMB = Naturhistorisches Museum, Basel, Switzerland.
NMSR = National Museum of S. Rhodesia, Causeway, Rhodesia.
NMW = Naturhistorisches Museum, Vienna, Austria.
NRS = Naturhistoriska Riksmuseum, Stockholm, Sweden.
OUM = Oxford University Museum, Oxford, England.
PV = coll. P. M. F. Verhoeff, Den Dolder, Netherlands.
UMMZ = University of Michigan, Museum of Zoology, Ann. Arbor, Mich., U.S.A.
USNM = United States National Museum, Washington D.C., U.S.A.
UZMC = Universitetets Zoologiske Museum, Copenhagen, Denmark.
WAM = Western Australian Museum, Perth, W. Australia.
ZMB = Zoologisches Museum der Humboldt-Universität, Berlin, East Germany.

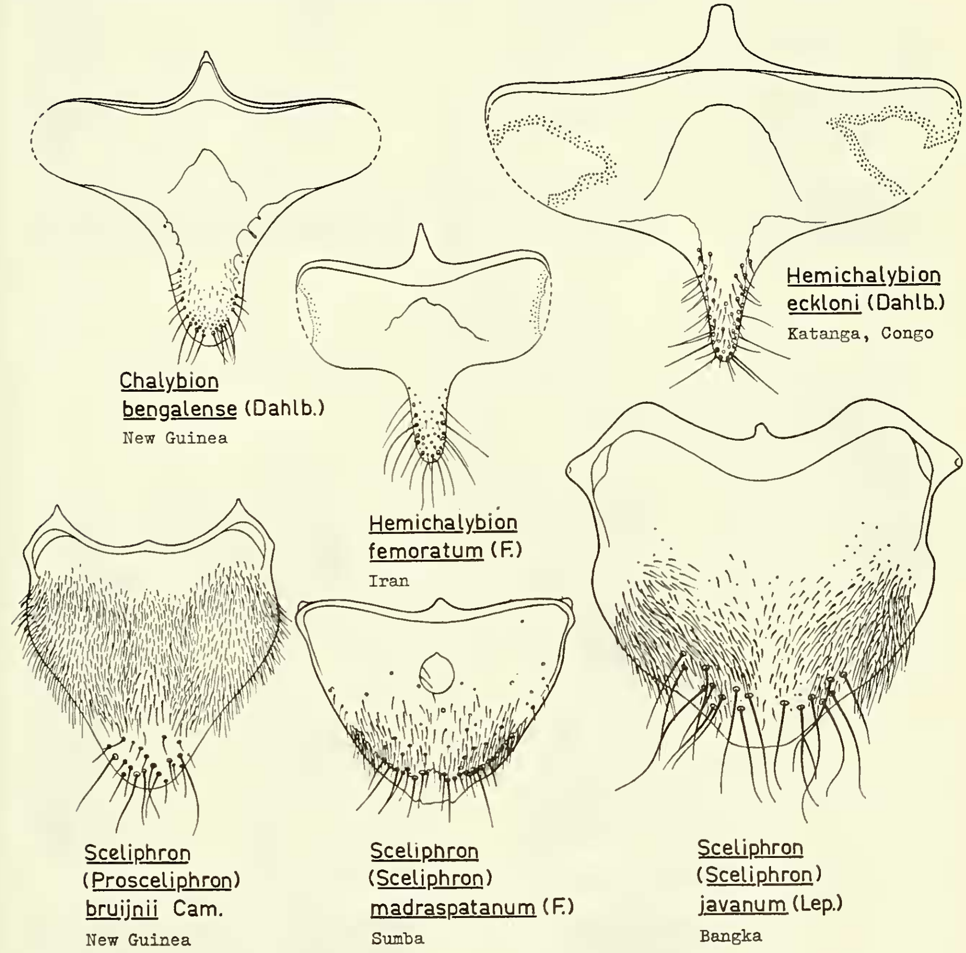
We are greatly indebted to the authorities and hymenopterists of the various museums as well as to the owners of private collections for enabling us to study the material in their care. Our special thanks are due to Dr. Delfa Guiglia, Genoa, who with the cooperation of Dr. U. Parenti in Turin helped us to solve the problem of the identity of *Pelopoeus fasciatus* Lepeletier.

In 1963 Dr. Karl V. Krombein, Smithsonian Institution, Washington, kindly took the trouble to concentrate much material, preserved in several American museums, in the

U.S. National Museum, thus greatly facilitating the study of these specimens by the senior author during a stay in Washington, D.C.[1]).

For preparing the drawings illustrating this paper the authors have been assisted by Mr. W. Bergmans, formerly Rijksmuseum van Natuurlijke Historie (Fig. 2—4) and Mr. H. Heijn, Dept. of Systematic Zoology, University of Leiden (Fig. 1, 9, 16, 17, 19, 24); the junior author made the drawings for Fig. 5—7, 10—12, 20—23, and 25—27; the senior author is responsible for the remaining ones.

The literature references at the end of the paper are restricted to some papers which have appeared during the last half century; for earlier publications we refer to Kohl, 1918. A comprehensive bibliography will be withheld for the final part.



Chalybion bengalense (Dahlb.)
New Guinea

Hemichalybion femoratum (F.)
Iran

Hemichalybion eckloni (Dahlb.)
Katanga, Congo

Sceliphron (Prosceliphron) bruijnii Cam.
New Guinea

Sceliphron (Sceliphron) madraspatanum (F.)
Sumba

Sceliphron (Sceliphron) javanum (Lep.)
Bangka

Fig. 2. Terminal sternite of the male of some Sceliphronini

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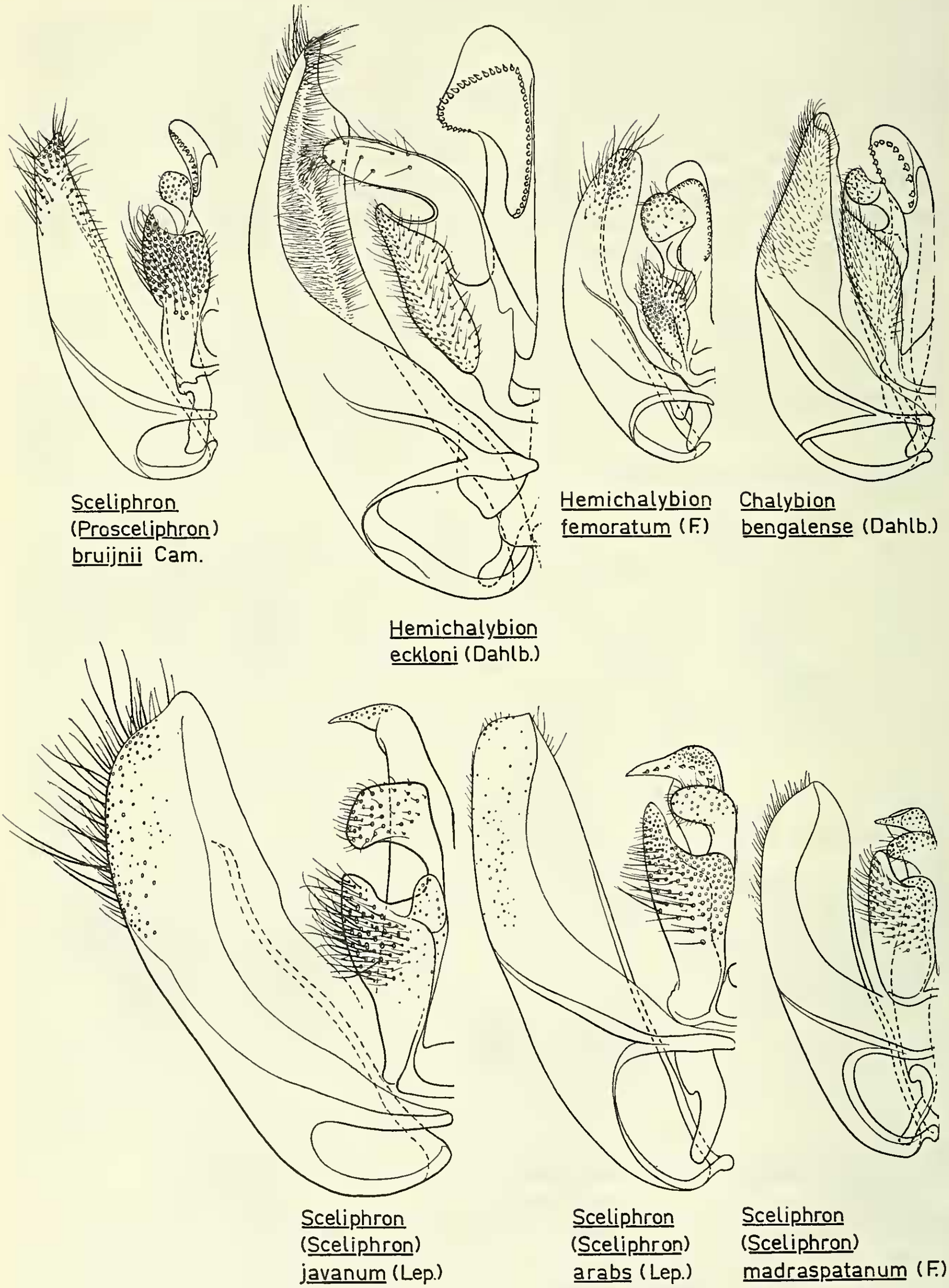
[1]) The investigations on the American material were supported by a grant from the National Science Foundation (no. GB-660 (201D-308)).



Sceliphron (Prosceliphron) bruijnii Cam.

Hemichalybion eckloni (Dahlb.)

Hemichalybion femoratum (F.)

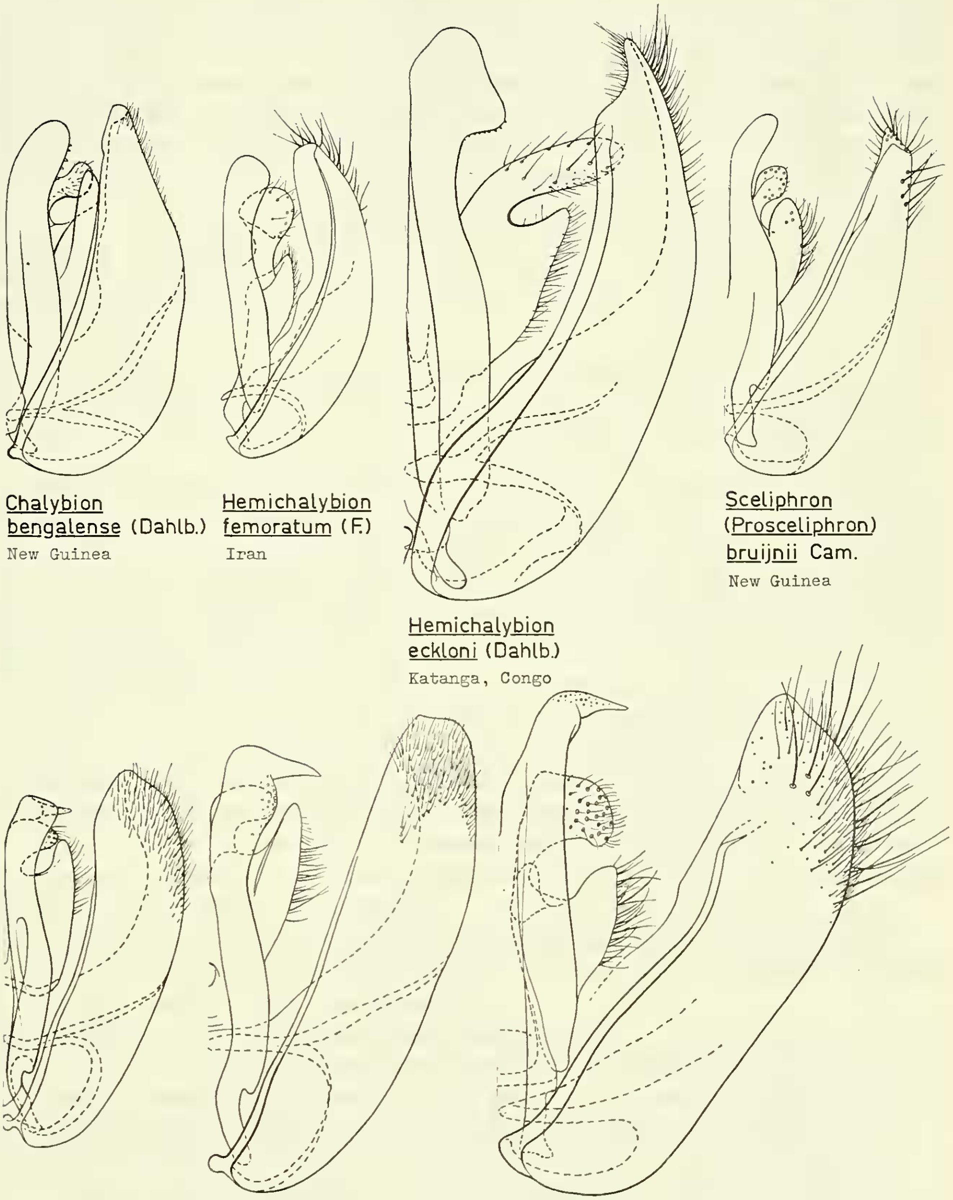
Chalybion bengalense (Dahlb.)

Sceliphron (Sceliphron) javanum (Lep.)

Sceliphron (Sceliphron) arabs (Lep.)

Sceliphron (Sceliphron) madraspatanum (F.)

Fig. 3. Ventral view of male genitalia of some Sceliphronini (cf. Fig. 4)



Chalybion
bengalense (Dahlb.)
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Hemichalybion
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(Sceliphron)
madraspatanum (F.)
Sumba

Sceliphron
(Sceliphron)
arabs (Lep.)
Azerbaydzhan

Sceliphron
(Sceliphron)
javanum (Lep.)
Bangka

Fig. 4. Dorsal view of male genitalia of some Sceliphronini

Generic and subgeneric divisions

Several early authors, including Patton (1880), Ritsema (1880), Radoszkowski (1891), and Pérez (1905), have regarded *Chalybion* as a separate genus. Kohl was generally inclined to recognize rather large genera, and this may have been one of the reasons why he did not accept this view. There are moreover some special difficulties connected with the recognition of *Chalybion* as a group of generic rank. One of these is the position of the species placed by Kohl in the subgenus *Hemichalybion*, a group which is restricted to the Ethiopian and Oriental regions, and which was regarded by Kohl as transitional between *Chalybion* and *Sceliphron*.

The Old World authors (Arnold, de Beaumont, Guiglia, Yasumatsu) have generally accepted Kohl's classification, but Leclercq (1955) and most American authors (Pate, Porter, Rau) have treated *Chalybion* as a separate genus. These latter workers were probably insufficiently acquainted with the *Hemichalybion* species to appreciate the difficulties arising from the intermediate position of this group. Leclercq solved the problem by treating *Hemichalybion* as a subgenus of *Sceliphron* (excl. *Chalybion*), but it seems very well possible that *Hemichalybion* is more closely related to *Chalybion* than to *Sceliphron* s. str.

In his provisional review of the group the senior author (Van der Vecht, 1961) adopted Kohl's classification and considered these groups as subgenera. In the present paper, however, we have followed Bohart and Menke (1963) who regard the group under discussion as comprising three genera (*Chalybion, Hemichalybion* and *Sceliphron*). Partly we do this for the sake of uniformity, for the rather generally adopted splitting up of the old genus *Sphex* into a number of genera requires a corresponding treatment of *Sceliphron* s.l. In addition, it has proved desirable to divide *Sceliphron* s. str. into two subgenera, differing in morphological as well as in ethological characters; yet these subgenera appear to be more closely related inter se than they are to *Chalybion* and *Hemichalybion*. These relationships are best expressed by giving the latter groups generic rank.

The genus *Sceliphron*, as it is now restricted by the exclusion of *Chalybion* and *Hemichalybion*, may be subdivided as follows:

1. Terminal gastral sternite of ♀ rather sharply keeled. Lower half of inner eye-margins almost parallel. Terminal tergite of ♂ with pygostyles. Second submarginal cell anteriorly wider than the third. Mandibles without tooth on inner side. Thorax dull, finely sculptured; metapleura finely granulate or transversely striate, dull . . . . **Prosceliphron** van der Vecht, subgen. nov. (type species: *Sceliphron coromandelicum* (Lepeletier))

— Terminal gastral sternite of ♀ slightly convex, rarely feebly keeled. Lower half of inner eye-margins distinctly converging towards the clypeus. Terminal tergite of ♂ without pygostyles. If the second submarginal cell is anteriorly wider than the third, the mandibles of the ♀ have as a rule a distinct tooth on inner side. Thorax in the Old World species less dull, particularly the metapleura distinctly shiny (in the New World species finely granulate). . . . . *Sceliphron* s. str. 2

2. Hind coxae normal or somewhat swollen, rounded on outer side. Inner side of mandibles with a more or less distinct tooth . . . . . *madraspatanum*-group

— Hind coxae swollen on outer side, as seen from above or below distinctly angular. Mandibles simple, except in *Sc. arabs* (which is distinguished by the bituberculate scutellum). Sides of propodeum in most species more sharply and coarsely striate than in the *madraspatanum*-group . . . . *spirifex*-group

In addition to the group characters discussed and figured at a previous occasion (Van der Vecht, 1961) we publish here some drawings of the terminal sternite and the genitalia of one or two males of each of the subdivisions of the old genus *Sceliphron* sensu Kohl (Fig. 2—4). They illustrate the high degree of similarity of the terminal sternite of *Chalybion* and *Hemichalybion*, and also show that in both these groups the rounded, sometimes strongly swollen, apex of the aedeagus is armed with a complete row of denticles. As stated in 1961, such denticles are also present in the species of the "*coromandelicum*-group" (= subgenus *Prosceliphron*). However, the conclusion that they are lacking in most of the other species of *Sceliphron* needs correction: it can now be said that the species of both the groups of *Sceliphron* s. str. show a tendency towards reduction of the denticles, as a rule associated with the formation of an apical tooth pointing in lateral direction.

SUBGENUS **Sceliphron** LATREILLE

A. Group of *Sceliphron madraspatanum* (F.)

Male genitalia: Fig. 5—7; pubescence of parameres usually short, but rather long in some insular species (*intrudens, fasciatum*); distal part of aedeagus (Fig. 7) with a row of teeth which may be more or less reduced, the apex bent in lateral direction to a varying degree, in the Old World species the apical part distinctly swollen and armed with a sharp tooth pointing in lateral direction; pubescence of volsellar cuspis very short in the African species; volsellar digitus rounded at apex on inner side in the Old World species (Fig. 8), here more or less angular in the American species, in which this part also shows greater specific differences (Fig. 14).

KEY TO THE SPECIES OF THE *madraspatanum*-GROUP

1. Mesepisternum more or less coarsely punctate, the interspaces in some species with microscopically fine puncturation, but not distinctly rugose; the mesepisternum thus as a rule shiny and usually more so than the striate sides of the propodeum. Mesepisternum with or without yellow mark beneath the tegulae. — Old World 2

— Mesepisternum distinctly rugose between the punctures, dull, not more shiny than the sides of the propodeum. Mesepisternum always with yellow mark beneath the tegulae. — New World 5

2. Tegulae marked with yellow; yellow markings on other parts of the body very variable (Fig. 10—12). Erect hairs of thorax yellowish-grey or whitish. — Mediterranean area to China and New Guinea . . . . *madraspatanum* (Fabricius)

— Tegulae brown or black, very rarely yellow in the African *Sc. quartinae*. Erect hairs of thorax often darker 3

3. Antennal scape orange-yellow anteriorly. Clypeus of ♂ produced anteriorly, depth of incision between the two rather sharp teeth equal to about 10% of interocular distance at the clypeus. Robust species with yellowish wings, superficially resembling *Sc. javanum*. Length ♀ 22—26 mm. — Celebes . . . . . *intrudens* (Smith)

— Antennal scape rusty brown or black. Anterior margin of clypeus of ♂ bluntly bidentate. Smaller species; length ♀ 16—22 mm. — Ethiopian region . . . 4

4. Hind coxae moderately convex at base on outer side (Fig. 13c). Pronotal collar relatively long, the anterior face not falling steeply away from the dorsal face (Fig.

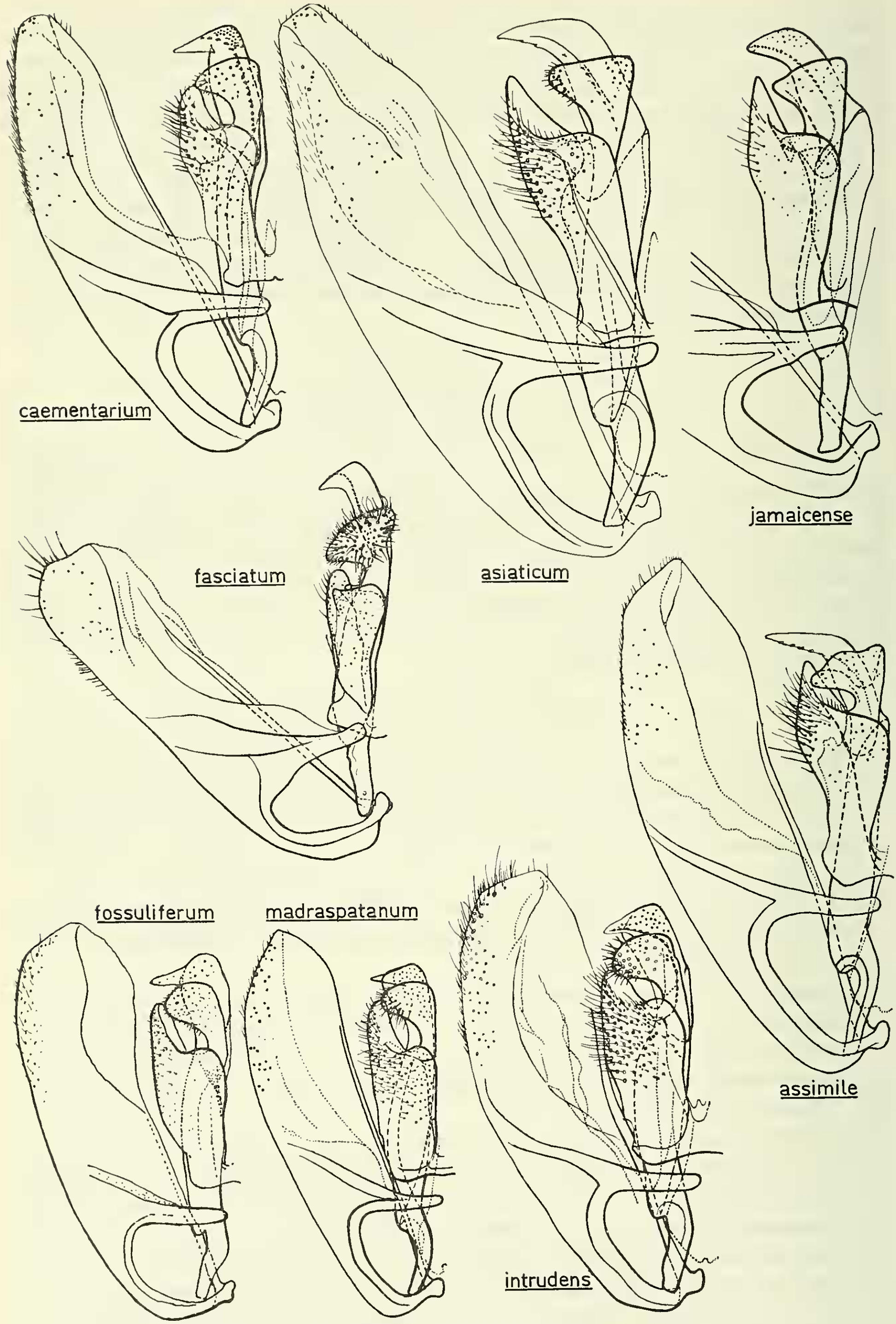


Fig. 5. Ventral view of male genitalia of species of the *madraspatanum*-group (cf. Fig. 6)

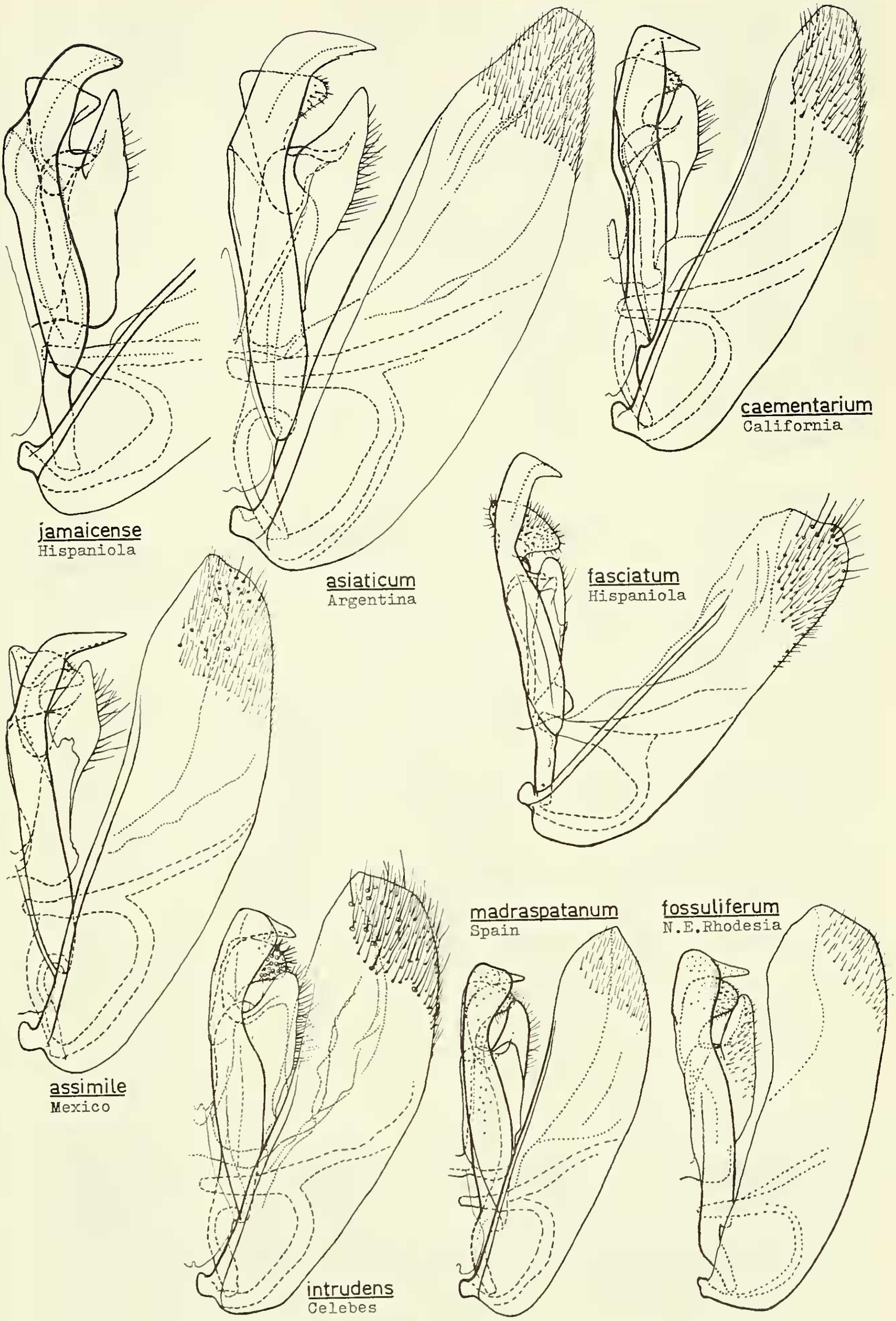
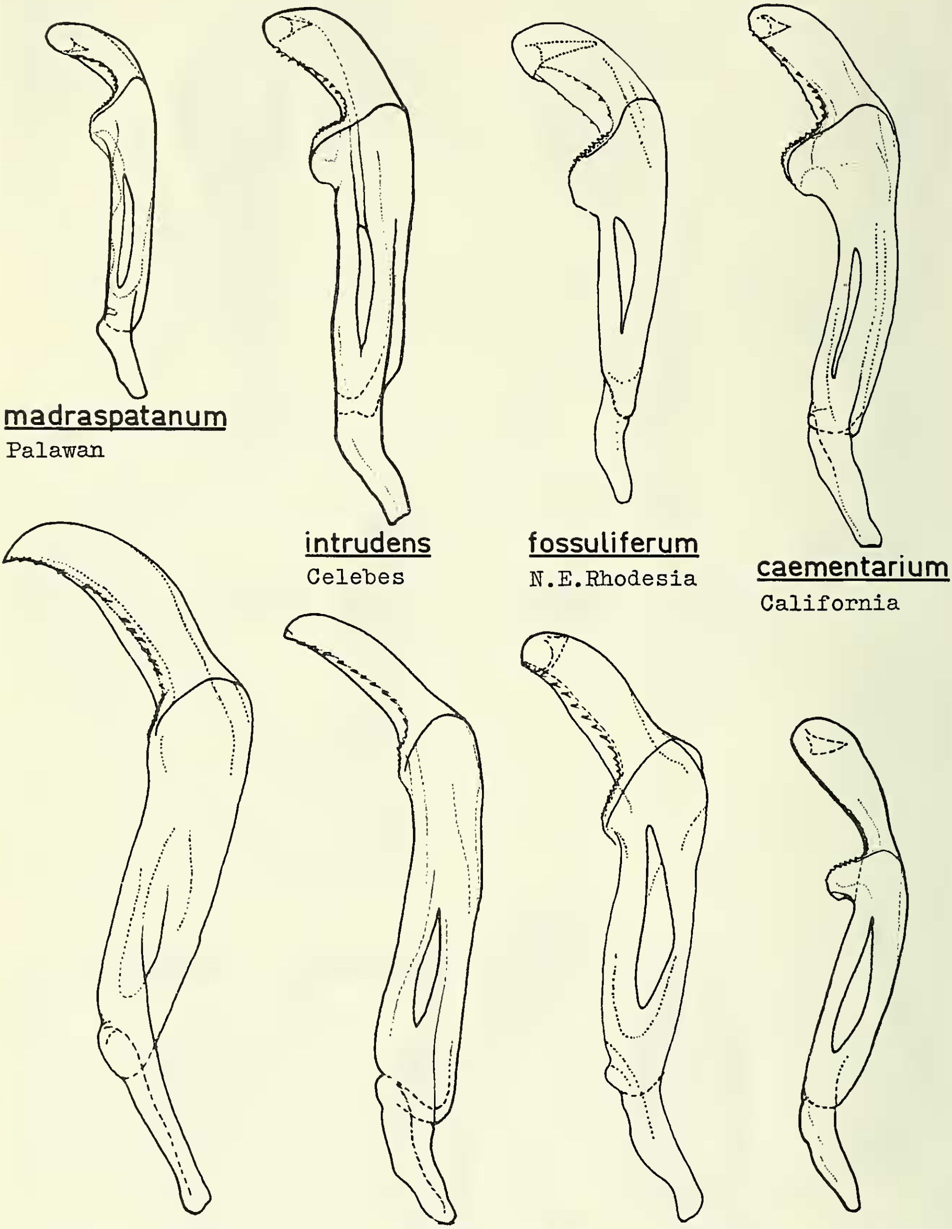


Fig. 6. Dorsal view of male genitalia of species of the *madraspatanum*-group



madraspatanum
Palawan

intrudens
Celebes

fossuliferum
N.E.Rhodesia

caementarium
California

asiaticum
Argentina

assimile
Mexico

jamaicense
Hispaniola

fasciatum
Hispaniola

Fig. 7. Inner side of left half of aedeagus of species of the *madraspatanum*-group

13a, b), the latter without a median impression. Sides of pronotum dull, very finely and closely striate, and rather densely punctate. Fore and mid tibiae yellow, the latter with at most a small brownish spot at apex. Body slender; wings with yellowish tinge; pubescence brownish . . . . *quartinae* (Gribodo)

— Hind coxae, as seen from above, distinctly swollen at base on outer side (Fig. 13e). Pronotal collar short, the anterior face falling more or less steeply away from the dorsal face (Fig. 13d), the latter with a distinct median impression. Sides of propodeum rather shiny, more coarsely and less closely striate, and with fewer punctures. Mid tibiae at least with brown or black mark on apical fourth, in certain forms fore and mid tibiae mainly or entirely black. Body stouter; wings hyaline to pale brownish; pubescence as a rule mainly black . . . . *fossuliferum* (Gribodo) (= *quartinae* auctt.)

5. Tegulae black. Legs black, with or without a yellow streak on the fore tibiae. Anterior portion of clypeus of ♂ short, its anterior margin truncate or very shallowly emarginate in the middle (Fig. 18) 6

— Tegulae yellow. Legs with extensive yellow markings. Anterior margin of clypeus of ♂ more or less distinctly bilobate (Fig. 15, 18) 7

6. Antennae rather stout; scape strongly swollen (Fig. 18). Lower part of yellow area of mesepisternum as seen from behind, regularly and moderately convex. Transverse striae of propodeum regular and sharply defined, the interspaces smooth and shiny, not distinctly punctate; near the base the striae straight or only slightly arcuate. Yellow band of pronotum well developed, only narrowly interrupted in the middle. Fore tibiae of ♂ black or with small yellow spot at the base. — Hispaniola; Guadeloupe . . . . *fasciatum* (Lepeletier)

— Antennae normal (Fig. 18). Lower part of yellow area of mesepisternum, as seen from behind, slightly bulging and prominent. Transverse striae of propodeum irregular and somewhat farther apart, the interspaces superficially and rugosely punctate; near the base the striae distinctly arcuate. Yellow band of pronotum sometimes rather widely interrupted in the middle and abbreviated laterally. Fore tibiae of ♂ with yellow stripe (?always). — Cuba . . . . . *argentifrons* (Cresson)

7. Pronotum on each side with yellow spot beneath the dorsal yellow band (reduced or absent in some specimens from the Bahamas). Second and third antennal segments more or less extensively marked with yellowish-brown. Hind trochanter yellow. Gastral tergites with yellow or testaceous band at apical margin 8

— Sides of pronotum black. At least the third antennal segment black. First gastral tergite usually more or less yellow, the following segments black 9

8. Apical bands of gastral tergites broad, brownish-yellow. Trochanter of fore and mid legs yellow. Femora entirely yellow. Gastral petiole yellow to reddish. — Lower California; ?N.W. Mexico . . . . *jamaicense lucae* (Saussure)

— Apical bands of gastral tergites narrow. Trochanter of fore and mid legs black. Gastral petiole black with yellow line on ventral side. — Cuba; Jamaica; Hispaniola; Bahamas . . . . *jamaicense jamaicense* (Fabricius)

9. Hind tibiae with broad yellow ring at base; hind tarsi partly yellow. Clypeus of ♂ rather broadly, but very shallowly emarginate anteriorly (Fig. 15). Propodeum in the forms with black petiole as a rule without yellow spots at the base. — North America; Lesser Antilles; accidentally introduced into many islands in the Pacific Ocean, and into Madeira, Japan, and perhaps Peru . . . *caementarium* (Drury)

— Hind tibiae entirely black, or with yellow spot or line of variable size on inner side at base, the basal part at least with a dark line on outer side. Anterior margin of clypeus of ♂ different 10

10. Clypeus of ♂ with two small and narrow lobes, the incision between these lobes shallow, from 4 to 7% of the interocular distance at the clypeus (Fig. 15). Hind tibiae usually with yellow streak on inner side of basal third to half, in the ♀ often less pronounced than in the ♂. Propodeum on each side with basal yellow spot. Genitalia of ♂: Fig. 5—6. — Central America, from Mexico to Costa Rica; Texas; ?Panama; Cuba; Jamaica . . . . *assimile* (Dahlbom)

— Clypeus of ♂ variable, the teeth lobe-like or more or less sharply pointed, but the incision between them always deeper than in *assimile* (from 8 to 22% of the interocular distance at the clypeus). Yellow streak on inner side of hind tibiae often small or absent. Genitalia of ♂: Fig. 5—6. — South America, also in Panama . . . . *asiaticum* (L.) (= *figulum* Dahlb.)

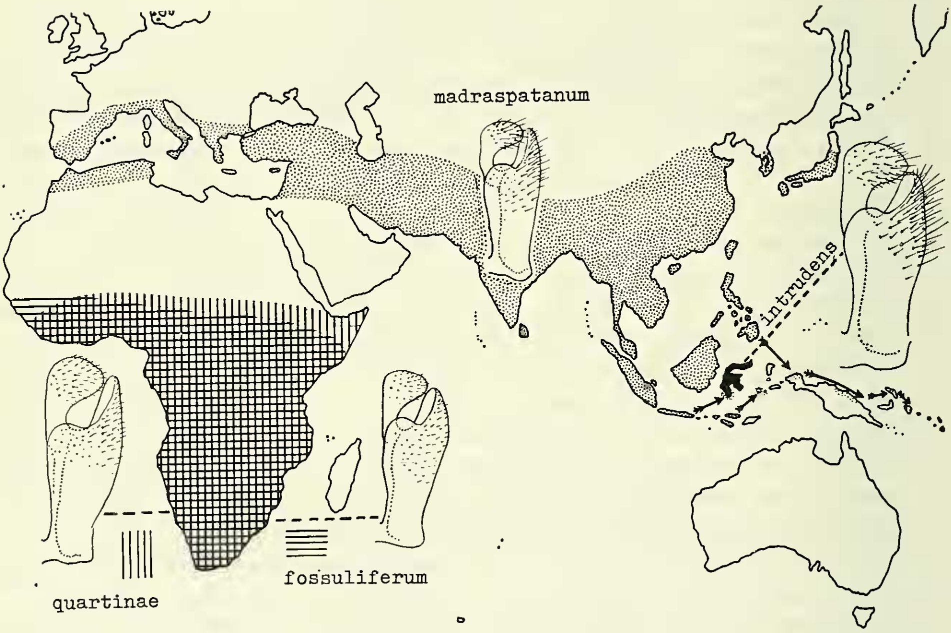


Fig. 8. Approximate distribution of the *madraspatanum*-group in the Old World, with figures of the volsella of each species (cf. Fig. 14)

1. Old World species

In the Old World this group is represented by four closely related species (Fig. 8), viz. one species which is distributed from the Mediterranean area to New Guinea, one which is restricted to Celebes, and two inhabitants of Africa south of the Sahara.

Sceliphron (Sceliphron) madraspatanum (Fabricius) (Fig. 3—12)

In his monograph Kohl (1918) treated the Palaearctic *Sc. tubifex* (Latreille) and the Oriental *Sc. madraspatanum* (Fabricius) as different species, although he said to be convinced that the two forms are not specifically distinct. As we have not found any valid reasons for maintaining this separation, *Sc. tubifex* is here regarded as a subspecies of the widely distributed and variable *Sc. madraspatanum*.

The variability is particularly expressed in the extent of the yellow markings. The darkest form is the "variety *andamanica* Kohl" (Fig. 10), occurring in the Andaman and Nicobar Islands; the most extensive yellow markings are shown by populations inhabiting the extreme western part of the Oriental region (subsp. *pictum* Smith, Fig. 10). In other parts of the extensive range various intermediate patterns can be observed. In some areas (or localities) the pattern is fairly homogeneous, in others specimens belonging to a single population may be found to vary between rather wide limits.

A satisfactory description of the variation of the species throughout its range is therefore by no means a simple matter.

After a detailed study of the available material we have come to the conclusion that it is possible to distinguish a number of more or less clearly defined subspecies. With a single exception, all of these have in the past been described as different species, subspecies or varieties, so that names for them are available. The typical patterns of these subspecies are shown in Fig. 10. It may be noted that in some cases the patterns of populations living in widely separated parts of the range are extremely similar (*tubifex* and *conspicillatum*, *kohli* and *sutteri*). The areas inhabited by the subspecies vary considerably in size and cannot be defined exactly. Partly this is because material from critical localities (or areas) is lacking, but even more important is the fact that the data give strong indications for the existence of a broad zone of intergradation wherever two subspecies are not separated by an important barrier (Fig. 9).

The presence of populations which are transitional between neighbouring subspecies, as well as the frequent occurrence of aberrant specimens of some of the subspecies, make it impossible to construct a key which would cover all the variations of the colour pattern occurring in nature. We have therefore restricted the following key to the typical patterns of the forms recognized here as subspecies. It should be stated expressly that the main purpose of this key is the arrangement of the more important differences between these forms in a convenient manner.

Key to the subspecies of *Sceliphron madraspatanum* (Fabr.) (compare Fig. 10—12)

1. Mesepisternum black, sometimes with more or less reduced yellow mark below the tegulae. Scutellum and propodeum typically without yellow markings 2

— Mesepisternum with yellow mark below the tegulae 3

2. Pronotum with narrowly interrupted yellow band; postscutellum with yellow band. — Southern India and Ceylon to Indonesia . . . . . . *madraspatanum* (Fabr.)

— Pronotum and postscutellum black. — Andaman and Nicobar Islands . . . . *andamanicum* Kohl

3. Propodeum black 4

— Propodeum typically with yellow markings (sometimes more or less reduced, or absent) 5

4. Inhabitants of Japan and China (southward to Indo-China). Scutellum as a rule black. Second segment of hind tarsi often yellowish or brownish . *kohli* Sickmann

— Inhabitants of Formosa. Scutellum with large yellow spot . . . . *formosanum* van der Vecht, subsp. n.

— Inhabitants of Sumba (and neighbouring Lesser Sunda Islands). Scutellum black or with small yellow spot. Second segment of hind tarsi black . *sutteri* van der Vecht

5. Dorsum of propodeum with large yellow marks, confluent with large yellow mark on declivity. — Turkmenia to West Pakistan . . . . *pictum* Smith

— Yellow spots on dorsum of propodeum, if present, separated from the spots on the declivity 6

6. Scape of antennae brownish to black. Pronotum without yellow spot on each side below the yellow band. Striation on sides of propodeum anteriorly almost reaching the groove between propodeum and metapleuron; the striae often almost horizontal. — Mediterranean area . . . . *tubifex* Latreille

— Scape of antennae more or less yellowish beneath (anteriorly). Pronotum sometimes with yellow spot on each side below the yellow band. Close to the groove between propodeum and metapleuron the striation is almost obsolete, the anterior margin of the sides of the propodeum being smooth and shiny; the striae distinctly oblique. Puncturation of mesepisternum slightly finer and sparser than in *tubifex*. — Philippine Islands; New Guinea to Solomon Islands . . . . *conspicillatum* (Costa)

Sceliphron madraspatanum tubifex (Latreille)

Sphex spirifex Linné, var. β; Rossi, 1790, Fauna Etrusca 2: 61, Pl. 2 F. 13 — Tuscany, Italy.

Pelopoeus tubifex Latreille, 1809, Gen. Crust. et Insect. 4: 61 — no locality given; based on Rossi's figure and on material received from M. Spinola.

Pelopoeus pectoralis Dahlbom, 1845, Hym. Eur. 1: 434 — "Europ. merid., Dufour, v. Heyden" (type from St. Sever, South France, in Mus. Lund).

Pelopoeus transcaspicus Radoszkowski, 1886, Hor. Soc. ent. Ross. 20: 24 — "Askhabad ou ses environs" (Mus. Krakow).

Sceliphron tubifex; Kohl, 1918, Annln naturh. Mus. Wien 32: 103 (p.p.).

Sceliphron madraspatanum tubifex; Gussakovskij, 1938, Ark. Zool. 30 (15): 4 ("die westasiatische und mediterrane Subspecies").

This form is widely distributed in the Mediterranean area, but in most places — or perhaps everywhere — it is less common than *Sc. destillatorium* and *Sc. spirifex*. The range as shown in Fig. 9 is mainly based on the records published by de Beaumont, Giner Mari, Grandi, Kohl, Morice, Pulawski and others; it is noteworthy that we have not found the species recorded from the Balearic Islands, Corsica, Sardinia, Malta, Rhodes, Libya, and Egypt.

The eastern limit of the range is uncertain, as we have seen only few specimens from Southwest Asia. If we have correctly placed *Sc. transcaspicum* (Rad.) in the synonymy of *Sc. tubifex*, this subspecies will probably meet *Sc. madraspatanum pictum* at approximately 60° E.

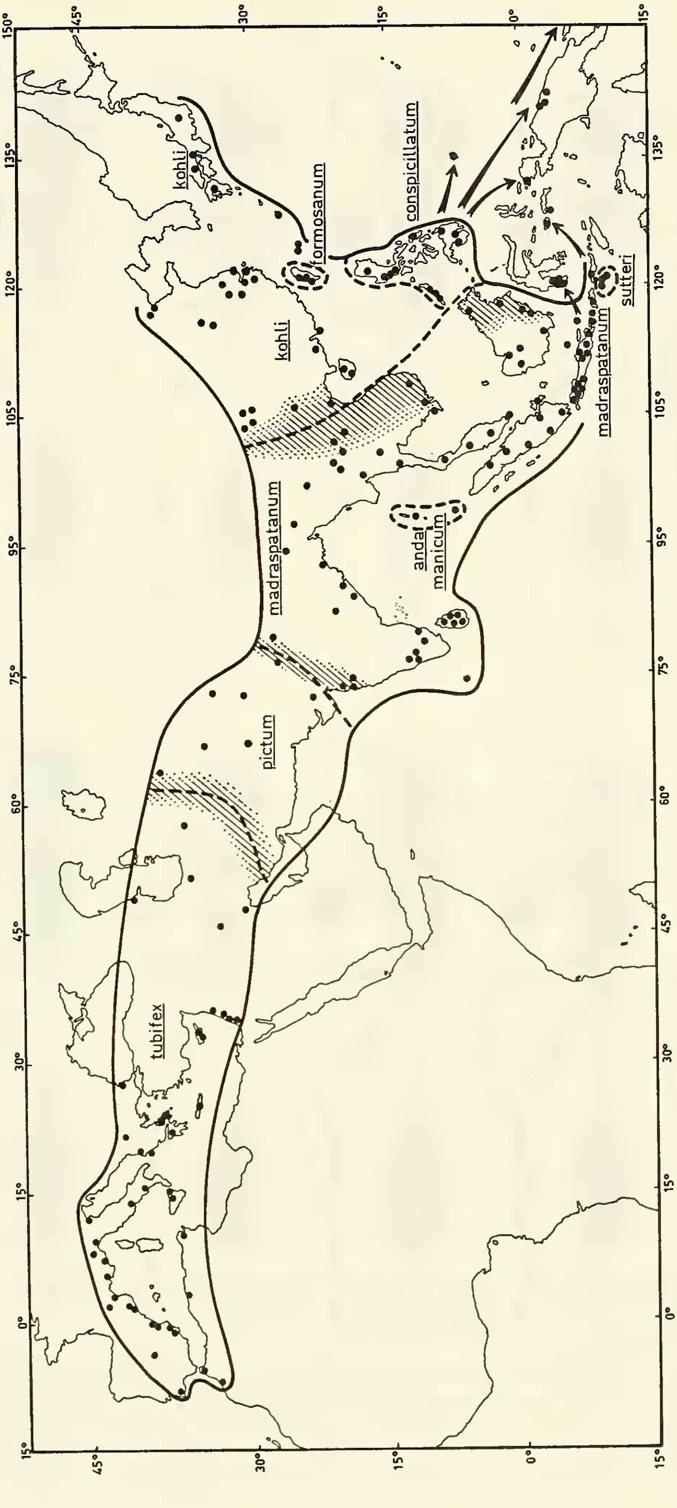


Fig. 9. Approximate distribution of the subspecies of *Sc. madraspatanum* (F.)

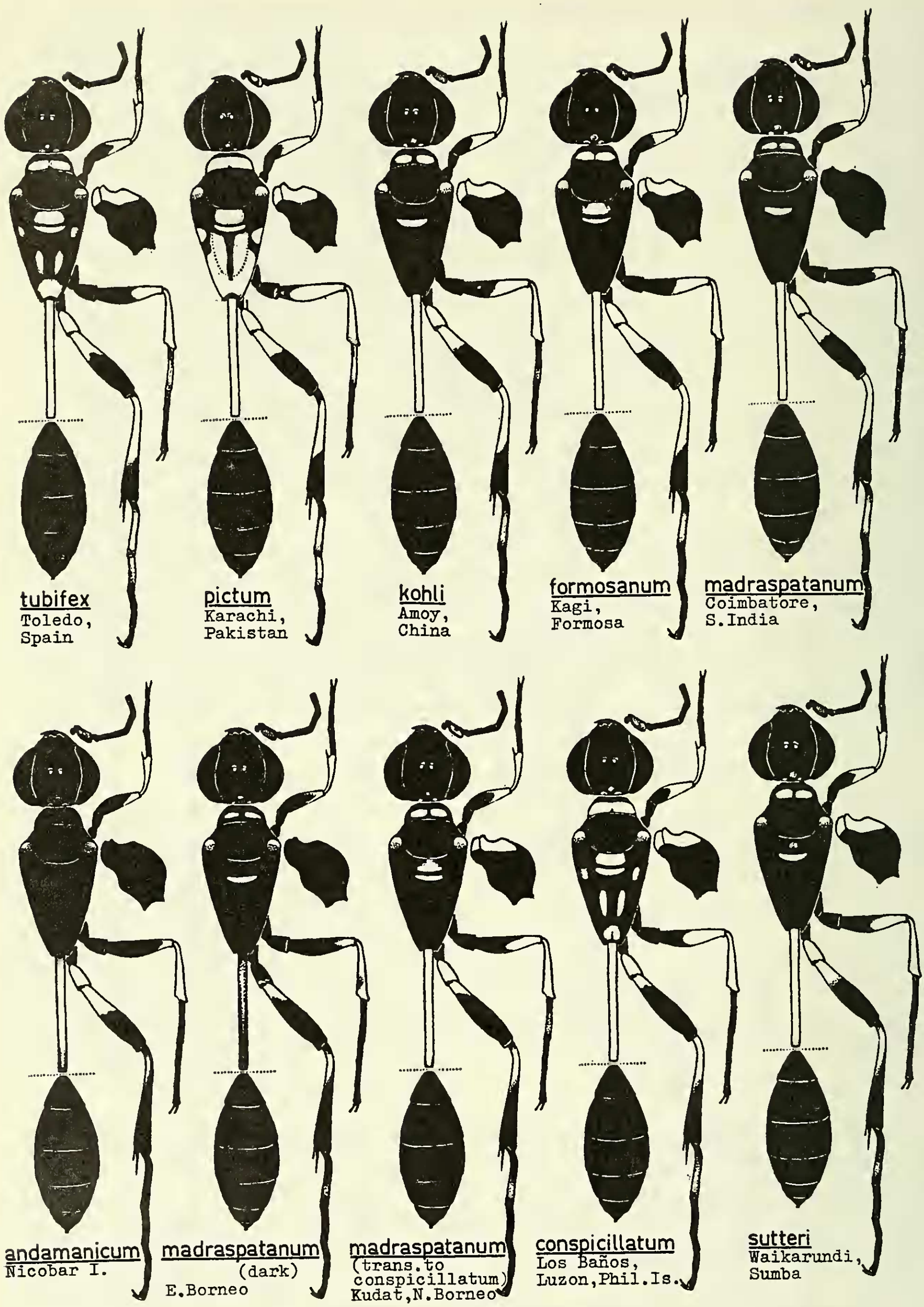


Fig. 10. Colour pattern (black, with yellow markings) of the subspecies of *Sc. madraspatanum* (F.); mesepisternum drawn separately

Sceliphron madraspatanum pictum (Smith)

Pelopoeus pictus Smith, 1856, Cat. Hym. Brit. Mus. 4: 231, ♂ — "India", coll. W. W. Saunders (OUM).

?*Sceliphron pictum*; Turner, 1917, Mem. Dept. Agric., Ent. Series 5 (4): 176 [*Sc. pictum* sensu Turner is possibly not the same as *Sc. pictum* (Smith)].

Turkmenia: 4 ♀ "Tschardschui" (Chardzhou or Tshardshou), G. von Rennenkampf (ML).

Iran: 1 ♀ "Persia, Bushire" (= Bushehr) (ETHZ). — Very similar to Fig. 10, no. 2, but the median black mark on the propodeum pin-shaped, consisting of a narrow line which is abruptly dilated into a small spot at the anterior margin.

Afghanistan: 2 ♂ "Afghanistan", Galatea (UZMC).

India or Pakistan: 2 ♂ with label "Ind." (OUM, coll. Saunders; syntypes).

West Pakistan: Peshawar Distr., 1 ♀ Taru, 16—29 May 1915, Fletcher coll. (BM); 1 ♀ 1 ♂ Lahore, April 1909, C. R. D. (BM, no. 1915-323); Quetta, 1 ♀ June 1902, 1 ♂ July 1902, 3 ♀ 3 ♂ Aug. 1902, leg. C. G. Nurse (BM); Karachi, 1 ♂ Manora, May 1899, F. W. Townsend (BM, no. 99-326), 5 ♀ April 1925 (MBUD; ML; NMW); 3 ♀ 3 ♂ "Kurrachee" (Karachi or Kurragee?), Aug.-Sept., Maindron (MP).

India: Bombay Prov., Deesa, 1 ♀ 3 ♂ June 1897, C. G. Nurse (BM), 1 ♀ June 1898, ex coll. Cameron (from Nurse) (BM; spots at base of propodeum lacking). — Punjab, 1 ♂ Ferozepore, July 1897, C. G. Nurse (BM). — "Bengal", 1 ♂ Pusa, June, 1909, CRD (BM).

Arabia: 2 ♀ 1 ♂ Muscat, A. S. G. Jayakar (BM, no. 99-73), 1 ♀ "Mascate", Sept.-Oct., Maindron (MP), 1 ♀ Oman, Ras-al-Khaima, 16 May 1949, G. V. Popov (BM).

Very probably 3 ♂ from "Calcutta" (IRSNB) are incorrectly labelled, for other specimens from this locality are much less marked with yellow.

Sceliphron madraspatanum kohli Sickmann

Sceliphron (*Pelopoeus*) *kohli* Sickmann, 1894, Zool. Jahrb. Syst. 8: 218, ♀ ♂ — "Tientsin" (1 ♀ 1 ♂ marked "type" by Kohl in Mus. Wien).

Sceliphron madraspatanum kohli; Gussakovskij, 1938, Ark. Zool. 30A (15): 4 (3 ♀ Kiangsu; *kohli* is the East-Asiatic subspecies of *Sc. madraspatanum*). — Yasumatsu, 1942, Mushi 14: 106 (Peking).

The East-Asiatic subspecies of *Sc. madraspatanum*, first recognized as such by Gussakovskij in 1938, appears to differ constantly from the nominate subspecies in the presence of a yellow line on the mesepisternum. The antennal scape is black, more or less distinctly yellowish beneath at apex. Scutellum rarely with yellow spot. The two subspecies meet in the Indo-Chinese peninsula, where further investigations will probably demonstrate the existence of a broad zone of intergradation.

Many specimens from the mountainous areas in the province of Szechwan (from 3000—8000 ft.) are rather strongly melanistic. The yellow markings on the antennal scape, the mesepisternum and the hind femora tend to disappear, the gastral petiole and the hind trochanters vary from partly to entirely black.

China: 2 ♀ "China", coll. Drewsen (UZMC). — Hopei, 1 ♂ Peiping, Aug. 1930, G. Lui (MCZ); 1 ♀ 1 ♂ Tientsin (NMW; "*Sc. kohlii* det. Sickmann, Type" in Kohl's handwriting); 2 ♀ Tientsin, one 25 May 1906, F. M. Thomson (BM, nos. 1904-229 and 1907-200); 2 ♀ Hsikou near Tientsin, 17 June 1906, F. M. Thomson (BM, no. 1907-200). — Honan, 1 ♀ Shanckow, Dr. Rennart (IRSNB). — Szechwan, 2 ♀ 4 ♂ Kuanshien, 3000 ft., 5 April—8 May 1930; 3 ♀ 1 ♂ Yachow, 2000—5000 ft., Aug. 1923, Sept. 1928, June 1929; 2 ♂ Yachow-Suifu, May-July 1930; 1 ♀ between Ta Tsien Lu and Yachow, 8000 ft., Aug. 1923 (scutellum with yellow spot); 11 ♀ 1 ♂ Suifu, 1000—1500 ft., 24 May—23 Oct. 1928 and July-Aug. 1929 (only 3 ♀ 1 ♂

with black mesepisternum); 1 ♀ between Yachow [Yaan] and Ning Yuen Fu, July 1928 (mesepisternum and petiole black); 1 ♀ 3 ♂ Suifu-Hong Ya, 1000—1400 ft., June 1929; 1 ♂ Hong Ya, 1800 ft., July 1928 (mesepisternum, hind trochanters and petiole black); 13 ♀ 4 ♂ Fulin [Hanyuan], 3000—7000 ft., July and Aug. 1928 (mesepisternum black in 9 ♀ 4 ♂); 1 ♀ Da Shiang, Lin Pass, 5000 ft., Aug. 1930; 2 ♀ between Fu Yao Lin Pass and Da Shiang Lin Pass, 5000 ft. and 8000 ft., Aug. 1923 (mesepisternum black; petiole partly or entirely black); 1 ♀ between Li To and Lu Ding Chiao, 4000—9000 ft., Aug. 1930; 1 ♀ Lu Ding Chao, 5000 ft., Aug. 1923, 1 ♀ do., 4000—9000 ft., July 1930; 1 ♀ Ning Yuen Fu, 6000—6200 ft., Aug. 1928 (thorax black except for yellow marks on tegulae and postscutellum; petiole black; hind trochanters black with narrow yellow ring at apex); 2 ♀ Yao Gi, 4000—8000 ft., July 1929 (all leg. D. C. Graham, USNM); 2 ♀ Kingfoo Shan, Aug.-Sept. 1932, G. Liu (MCZ); 2 ♂ Chang-Tau-Ching, 800—1000 ft., 18 July 1948, Gressitt and Djou (CAS). — Kweichow, 2 ♀ "Kouy Tcheou, région de Pin-Fa" (= Pingpa) and "environs de Kouy-Yang" (= Kweiyang) (MP). — Kiangsu, 2 ♀ "prov. Kiangsu", Kolthoff (NRS), 4 ♂ Nanking, 24 June 1923, E. C. Van Dyke (CAS); 1 ♀ 1 ♂ Chinkiang, 10 June and 19 July 1924, J. F. Illingworth (BISH); specimens from Shanghai and Zo-sè, leg. O. Piel (MP); 1 ♀ Shanghai, Walker coll. (BM, no. 92-196); 1 ♀ Shanghai (MBUD). — Chekiang, 1 ♀ Hangchow, July 1924, J. F. Illingworth (BISH); 1 ♀ 4 ♂ do., June-Aug. 1926, H. A. Jaynes, T. P. Chiao and J. T. Chu (1 ♂ with yellow spot on scutellum) (USNM); 2 ♀ Ningpo, Aug. 1949, ex Mus. Fribourg (NMB); 1 ♀ Ningpo, leg. Felder (ML). — Fukien, 1 ♀ Foochow, C. B. Rickett (BM, no. 1901-310); 1 ♂ do., S. F. Light (CAS); 1 ♀ 2 ♂ do., June 1935—June 1936, M. S. Yang (BM); 1 ♀ 1 ♂ do., C. R. Kellogg (USNM); 1 ♂ do., Oct. 1923 (scutellum with yellow spot) (USNM); 2 ♀ Futsing, Aug. 1938, H. Caldwell (AMNH); 3 ♀ Yenping (= Nanping), Spring 1915, 3 Aug. 1917, 10 June 1920 (AMNH); 2 ♀ Amoy, leg. Budding (ML); 1 ♂ Amoy, Galatea (UZMC). — Kwangtung, 1 ♀ Liu Ping, 1 ♀ Lung Fao Shan, 1 ♀ 1 ♂ Canton, leg. Mell (ZMB); 3 ♀ Mei-hsien, 8 June 1936 (MCZ). — Hainan I., 2 ♂ Ta Hian, 1 ♂ Ta Hau, June-July 1935, 1 ♀ 1 ♂ Nodoa, 1 ♀ Dome Mt., 13 July 1935, all L. Gressitt (MCZ). — Hongkong, 1 ♂ Hongkong, Galatea (UZMC).

Vietnam (see also p. 207): 1 ♀ Hanoi, 17 Aug. 1917, R. V. de Salvaza (BM); 1 ♀ "Annam, Ten Sin", Nov. 1916, R. V. de Salvaza (BM); 4 ♀ 7 ♂ Hanoi, April-May 1917, V. Demange (MCZ).

Japan: 1 ♀ 1 ♂ "Japan", von Siebold (ML; in ♀ propodeum with basal spots, in ♂ scutellum with small spot, divided by median black line). — Honshû, 3 ♀ 3 ♂ Hyogo, ex coll. Smith (BM); 1 ♂ Kyoto, 15 Aug. 1954, P. H. Arnaud (MCZ); 1 ♂ Saijo, leg. Harima (CAS); 1 ♂ Yokohama (MBUD). — Kyûshû, 1 ♀ Nagasaki, coll. Drewsen (UZMC); 1 ♀ Nagasaki, Xántus (MBUD). — According to information received from Prof. K. Iwata the species inhabits Honshû, Shikoku and Kyûshû, but is lacking in Hokkaido. Prof. K. Tsuneki recently wrote us that about twenty years ago this species did not occur east of Lake Biwa, but that it has recently spread in northern direction and is now common in the province of Kanto.

Ryukyu Is.: Okinawa, 1 ♂ "Okinawa", C. T. Parsons (MCZ); 1 ♀ Iwa, F. G. Werner (MCZ), 2 ♂ Iwa, C. T. Parsons (MCZ); 1 ♀ Motobu Peninsula, Yaetake, 8 Nov. 1945 (UMMZ); 1 ♂ Chizuka, G. E. Bohart & C. L. Harnage (CAS). — Miyako, 1 ♀ 2 July 1932, L. Gressitt (MCZ). — Ishigaki, 1 ♀ 10 May, J. C. Thompson (CAS). — Iriomote, 2 ♀ 1 ♂ 22 Aug. 1934, L. Gressitt (MCZ; ♂ with yellow spot on scutellum).

Sceliphron madraspatanum formosanum van der Vecht, subsp. nov.

♀ ♂ — Very similar to subsp. *kohli*, but the scutellum with large yellow spot. The pattern is shown in Fig. 10.

Formosa: 1 ♀ Kagi, 21 Aug. 1907, H. Sauter (ML; bought 6 July 1908, type); the following specimens are paratypes: 1 ♀ Takao, 1907; 2 ♂ Kagi, 21 Aug. 1907, 2 ♂ Koroton, 1—15 Sept. 1907, all leg. H. Sauter (ML; bought 6 July 1908; in one ♂ the propodeum has small basal spots); 3 ♂ Kagi, 26 Aug. 1907, H. Sauter (BM, no. 1919-234); 12 ♀ 14 ♂ Takao, Taihanroku, Tainan, and Kagu, 1907-09, H. Sauter (MBUD; propodeum in 4 ♀ with traces of yellow spots, in one ♀ with three pairs of spots as in fig. 12, no. 2 of bottom row); 6 ♀ 2 ♂ "Formosa", H. Sauter (AMNH); Taipei, 1 ♀ 13 July 1956, 1 ♀ 30 May 1958, 1 ♂ 12 June 1958, all K. S. Lin (BISH); 1 ♀ Puli (Hori), July 1954 (BISH); 1 ♀ Taihanroku, H. Sauter (CU).

Sceliphron madraspatanum madraspatanum (Fabricius)

Sphex madraspatana Fabricius, 1781, Spec. Insect. 1: 445 — "Malabar", coll. Banks (BM).

Sphex maderospatana (!); Gmelin, 1790, in Linné, Syst. Naturae (ed. 13) 1 (5): 2727.[1])

?*Sphex lugubris* Christ., 1791, Naturgesch. Ins. etc. Frankfurt: 306, Pl. 30 Fig. 5 — "St. Domingo" [invalid homonym of *Sphex lugubris* Villers, 1789][2]). — Dalla Torre, 1897, Cat. Hym. 8 : 379 (in synonymy of *Sceliphron caementarium* (Drury)), 387 (*Sceliphron lugubre* Christ). — Schulz, 1903, Sitz. Ber. Akad. München, math.-phys. Kl. 1903: 470 (unidentified species, perhaps a var. of *Sc. caementarium*) [overlooked by Kohl, 1918].

Pelopoeus interruptus Palisot-Beauvais, 1805, Ins. rec. en Afr. et Amer., Hym.: 50, Pl. 7 Fig. 5 — from unknown locality, probably in Asia. — Schulz, 1906, Spolia Hym.: 192 (synonym of *Sceliphron "maderospatanum"* (Fabr.)).

Pelopoeus bilineatus Smith, 1852, Ann. Mag. nat. Hist. (2) 9: 47, ♀ — "Bombay", leg. E. T. Downes (BM, no. 21.608).

Pelopoeus separatus Smith, 1852, Ann. Mag. nat. Hist. (2) 9: 47, [♀ !] — "Bombay", leg. E. T. Downes (BM, no. 21.609).

Sceliphron madraspatanum; Turner, 1917, Mem. Dept. Agric., Ent. Series 5 (4): 176 (p.p.; excl. *kohli* and *bilineatus*).

Sceliphron (*Pelopoeus*) *madraspatanum*; Kohl, 1918, Annln naturh. Mus. Wien 32: 109 [in part].

Tibet: 1 ♂ Jarkalo (MBUD).

India: 3 ♀ "India" (OUM). — Western India: 1 ♀ Bombay, Capt. Downes (BM; type of *Pelopoeus bilineatus* Smith, no. 21.608; in addition to the normal pattern: mesepisternum with yellow stripe, propodeum with two lines on posterior two-thirds of dorsum, and a small spot on the declivity); 1 ♀ Bombay, Capt. Downes (BM; type of *Pelopoeus separatus* Smith, no. 21.609; mesepisternum and propodeum black); 2 ♀ Bombay, 30 Sept. 1928 (MBUD; one with minute mark on mesepisternum, the other moreover with small spots on scutellum and propodeum); 1 ♀ Bandra, Dr. Jayakar (BM, no. 1905-152); Poona, 1 ♀ 1 ♂ Western Ghats, Sept. 1962, F. L. Wain (ML). — Southern India: 3 ♀ Malabaria, coll. Colsm. (UZMC); 1 ♀ 1 ♂ Tranquebar, coll. Westermann (UZMC). Mysore, 1 ♀ Shimoga, R. Tunga, 1865 ft. (MCZ). Kerala, 1 ♀ Walayar Forests, Sept. 1951, P. Susai Nathan (KVK), 1 ♀ 2 ♂ do., 700 ft., Oct. 1959 and Oct. 1962, P. Susai Nathan (ML; 1 ♂ with minute spot under tegula). Madras State, 1 ♀ Nilgiri Hills, Singara, 3400 ft., May 1948, P. Susai Nathan (MCZ), 1 ♀ Coimbatore, July 1923 (MCZ), 1 ♂ do., 17 July 1934 (BM), 1 ♀ do, 15 Febr. 1939 (MR), 9 ♀ 2 ♂ do., 1400 ft., July 1955, Aug. and Oct. 1959, May-Nov. 1960, P. Susai Nathan (ML; 1 ♀ with yellow mark on mesepisternum and small spot on scutellum, 1 ♂ with minute spot under tegula), 1 ♀ do., Sept. 1961, P. Susai Nathan (LAM); 2 ♂ Tanjore (= Thanjavur), Nedungadu, 26—27 April 1938, P. Susai Nathan (MR). Karikal Terr., 5 ♀ Kurumbagaram, P. Susai Nathan (MCZ), 1 ♀ do., April 1951, P. Susai Nathan (KVK), 17 ♀ 14 ♂ Pondichery, April 1962, P. Susai Nathan (ML; a few specimens with minute spots on mesepisternum and scutellum, in one ♀ propodeum with very small basal and apical spots). — Central India: Madhya Pradesh, 1 ♀ 1 ♂ Raipur, 18—27 Aug. 1962, F. L. Wain (ML; ♀ with traces of yellow spot on scutellum); Andra Pradesh, 2 ♀ Vizagapatam, Dec. 1926, leg. Fraser (BM). — Kashmir: 1 ♀ Murree-Kashmir Road, 4000 ft., June 1901, C. G. Nurse (BM); 1 ♂ Kangra Valley, 4500 ft., June 1899, leg. Dudgeon (BM, no. 1904-35). — Sikkim: 1 ♀ Sikkim, F. A. Möller (UZMC), 1 ♂ do., 1800 ft., July 1897, leg. Dudgeon (BM; small spot on mesepisternum), 1 ♀ do., coll. Bingham (BM, no. 1902-120; mesepisternum with two small spots). — Bengal: 2 ♀ 1 ♂ Bengal, coll. Drewsen (UZMC); 1 ♂ Calcutta, coll. Rothney, from F. Smith (ML; mesepisternum with small spot), 6 ♀ 5 ♂ do., Oct. 1908—July 1909, E. Brunetti (BM), 1 ♀ 1 ♂ do., 1961, Dr. H. Spurway (ML; ♂ with reduced spots on mesepisternum and scutellum); series from Barrackpore, coll. Rothney (OUM; a few females with small yellow spots on mesepisternum and scutellum). — Assam, 1 ♂ "Assam", from Westwood (ML).

Ceylon: 2 ♀ "Ceylon", coll. Drewsen (UZMC); 8 ♀ 16 ♂ from eleven localities throughout the island, 1953-4, F. Keiser (NMB; ML; in a few males gastral petiole more or less blackened at

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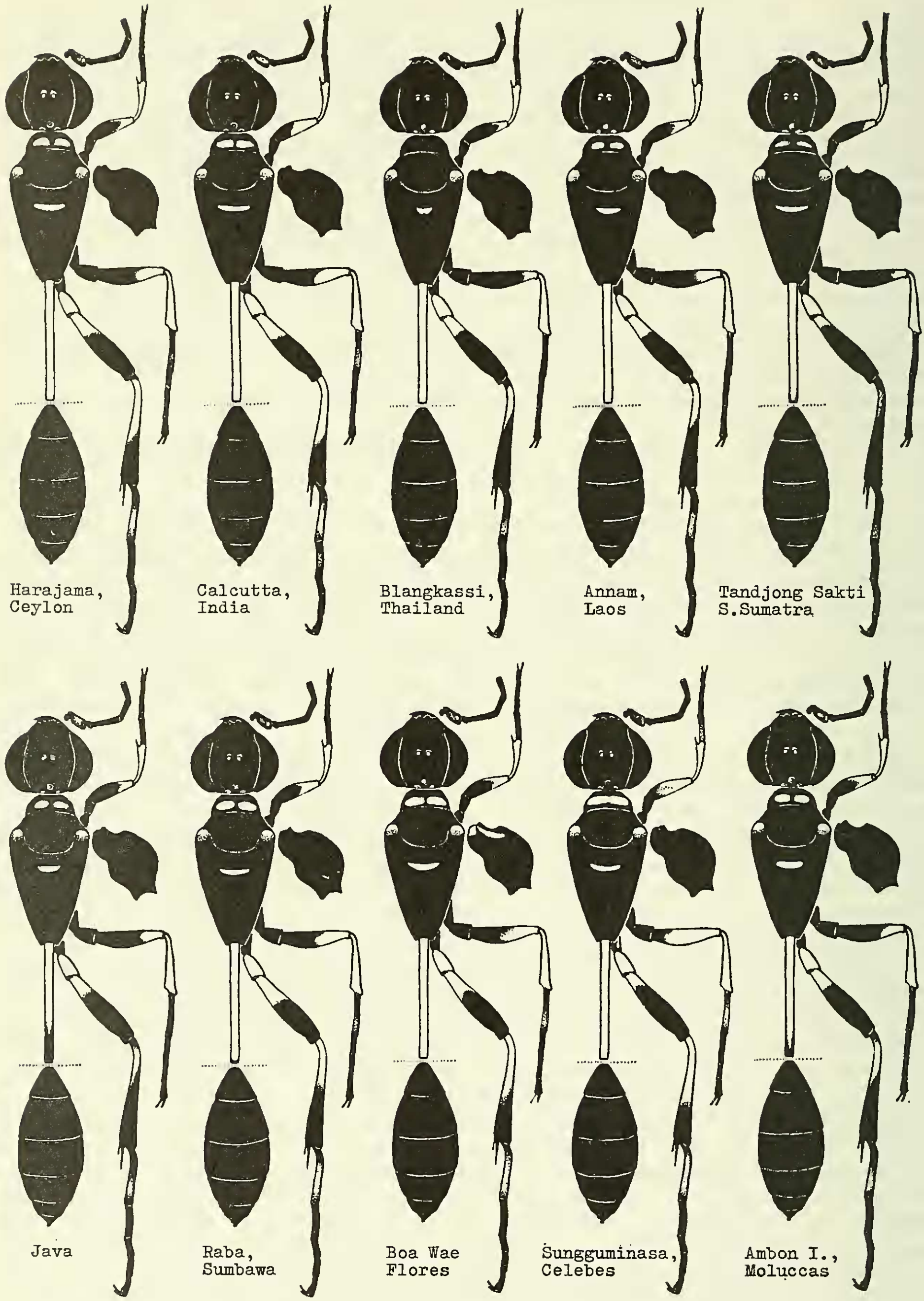
[1]) This spelling is erroneously ascribed to Fabricius, 1781, in Kohl's list of references (1918: 109).

[2]) Very probably the locality is erroneous, for the description applies much better to typical *Sc. madraspatanum* than to any of the American species.



Harajama, Ceylon

Calcutta, India

Blangkassi, Thailand

Annam, Laos

Tandjong Sakti S.Sumatra

Java

Raba, Sumbawa

Boa Wae Flores

Sungguminasa, Celebes

Ambon I., Moluccas

Fig. 11. Variation of the nominate subspecies of *Sc. madraspatanum* (F.) throughout its range

apex, one of these males is strongly melanistic: pronotum almost entirely black, hind trochanters with black blotch on inner side, hind femora with only a narrow yellow ring at the base).

Maldive Is.: 2 ♀ 1 ♂ Addu Atoll, 22 Aug.—28 Oct. 1958, W. W. A. Phillips (BM).

Burma: 3 ♀ Myitkyina, 20 May 1945, W. Miller (KU). — Tenasserim, 1 ♂ Salween Valley, 7-90, coll. Bingham (BM); 1 ♀ Pegu, D., coll. Bingham, 96-30 (BM); 1 ♀ Tavoy, 2 Oct. 1893, coll. Bingham, 96-30 (BM); 1 ♀ Thaungyin, Febr. 1891, 1 ♂ Mergui, Nov. 1889 (OUM).

Thailand: 1 ♀ Nan, Dec. 1931, T. D. A. Cockerell (AMNH); 4 ♀ 2 ♂ Chiang Mai prov.: Chiang-dao, 450 m, April 1958, T. C. Maa (BISH; in one specimen postscutellum black); 1 ♀ Blangkassi, km 208, R. van der Veen, Oct.-Nov. 1943 (ML; pronotum black; yellow mark on postscutellum slightly smaller than usual, yellow ring on hind tibia covers basal half on inner side, but less than basal fourth on outer side; yellow part of hind basitarsus small); 1 ♀ Bangkok, 3 Dec. 1957, J. L. Gressitt (BISH); 1 ♂ do., Febr. 1930, Hugh Smith (small spots on mesepisternum) (USNM); 2 ♂ do., 22 Sept. 1935 (CU; mesepisternum with two small yellow spots); 1 ♀ 1 ♂ Banna, Nakhon, May 1958, T. C. Maa (BISH). — "Peninsular Siam", 1 ♀ Trang, Banchong, 25 April 1924, I. H. N. Evans, 1 ♀ Nakon Sri Tamarat, Ronpibum, 7 April 1922, H. M. Pendlebury (BM).

Laos: 1 ♀ 5 ♂ "Laos" (MBUD); 1 ♀ Luang Prabang, Ban Samang, 20 Nov. 1918, R. V. de Salvaza (BM); 1 ♂ Luang Prabang, Hat Thoun, 10 Nov. 1917, R. V. de Salvaza (BM; thorax black, only tegulae and postscutellum with traces of yellow); 1 ♀ Mouc Dahan, J. F. Godfrey (BM, no. 1920-244, very dark form); 1 ♀ Ha Peng (?Na Peng), 3 Nov. 1919, R. V. de Salvaza (BM; small spots on mesepisternum).

Vietnam: (see also p. 204): 2 ♀ 1 ♂ M'drak, East of Ban Me Thuot, 4—600 m, Aug. and Dec. 1960, C. M. Yoshimoto (BISH; in one ♀ mesepisternum on one side with small yellow spot); 4 ♀ 2 ♂ Tayninh, Nov. 1923, 2 ♀ 1 ♂ Phuquoc Isl., 1924 (IRSNB; mesepisternum with yellow mark, in some specimens reduced; spot on scutellum more or less reduced, absent in one ♀, propodeum in one ♀ with small basal spots; ♂ generally a little darker than ♀).

Cambodia: 1 ♀ Pnom Penh (MP; mesepisternum and scutellum marked with yellow!).

Not located: 1 ♀ Cochinchine, Trian, 7 Oct. 1923, R. Vitalis de Salvaza (KVK).

Malaya: In a series of specimens (BM) from several localities, including Upper Perak, Kuala Kedah, Kuala Langat, Kuala Lumpur, Negri Sembilan, and Singapore, the pattern is usually normal; among 6 ♀ 6 ♂ from Kedah, however, 3 ♀ 2 ♂ have yellow spots on scutellum and mesepisternum, 3 ♀ 4 ♂ have only a more or less reduced spot on mesepisternum, the males are generally slightly darker than the females.

Sumatra: Fairly common throughout the island; we have seen specimens from Deli, Indragiri, Bengkulen, Djambi and Lampong (MZB; ML; band on pronotum rather widely interrupted, absent in 1 ♀ 1 ♂ from South Sumatra; yellow markings on hind tibia and basitarsus more or less reduced, petiole sometimes slightly blackened at apex).

Bangka Is.: 1 ♂ Pangkalmundo, 10 April 1931, J. van der Vecht (ML; similar to the less melanistic Sumatran specimens).

Borneo: 2 ♀ 3 ♂ "Borneo", S. Müller (ML), 1 ♀ "Borneo", Schwaner (ML). — Sarawak, 1 ♀ Nanga Pelagus near Kapit, 180—585 m, Aug. 1958, 1 ♀ Merirai Valley near Kapit, 180 m, July-Aug. 1958, both T. C. Maa (BISH). — Brit. N. Borneo, 2 ♀ West Coast Residency, Ranau, 500 m, Sept.-Oct. 1958, L. W. Quate (BISH; scutellum and mesepisternum with yellow mark, band on pronotum only slightly interrupted); series from Bettotan and Kudat, July-Sept 1927, Boden Kloss & Pendlebury (BM; 2 ♀ 2 ♂ ML; partly with yellow markings on scutellum and mesepisternum, but yellow parts of legs often somewhat reduced). — West Borneo: 1 ♂ Marbau Tjondong, 1923 (MZB); 1 ♂ Bengkajang at Ledo River, July 1933, H. R. A. Muller (ML; petiole black above, yellow on hind legs much reduced); 1 ♂ Sintang, 1910 (ZMB). — East Borneo: 1 ♀ Samarinda, Muara Kaman, Nov. 1950, 1 ♀ 2 ♂ Balikpapan, Wain and Mentawir Rivers, Oct.-Nov. 1950, 1 ♀ 2 ♂ Tabang, Bengen River, Aug. 1956, 2 ♀ Kembang Djangut, July 1956, all leg. A. M. R. Wegner (ML); 1 ♂ Kariorang, April 1937, Mrs. M. E. Walsh (BM); series from several localities, leg. A. M. R. Wegner, in MZB.

The pattern of the Bornean populations shows a high degree of variability. Whereas there is on one hand a tendency towards development of yellow markings on scutellum and mesepisternum, certain other parts of the body, particularly the petiole and the hind legs, are often subject to strong melanization.

Some data on the material in the Leiden Museum (10 ♀ 13 ♂): scutellum with small spot in 1 ♀

"Borneo", with medium to large spot in 2 ♀ 2 ♂ N. Borneo and 4 ♂ E. Borneo (two females with large spot were among the series from E. Borneo in MZB); mesepisternum with yellow stripe in 2 ♀ 2 ♂ N. Borneo, with reduced stripe in 2 ♀ E. Borneo; hind trochanters partly black in 3 ♀ 4 ♂ E. Borneo, 1 ♂ W. Borneo; gastral petiole at least half black in 2 ♂ "Borneo", 1 ♂ W. Borneo and 3 ♀ 5 ♂ E. Borneo. Two extreme patterns are shown in Fig. 10.

Java: Common throughout the island, up to about 1400 m above sea level. We have examined 75 ♀ and 72 ♂ from many localities, mainly in West Java. Colour pattern very constant, slightly darker than typical *madraspatanum*; yellow mark on antennal scape sometimes indistinct, yellow band on pronotum always distinctly interrupted, scutellum and mesepisternum always black, gastral petiole usually blackened at extreme apex, rarely more extensively black; hind basitarsus with inconspicuous brownish ring.

Bawean: 1 ♀ leg. Fruhstorfer (ML); 1 ♀ June 1920, H. C. Delsman (MZB).

Kangean Is.: 2 ♀ Ardjasa, Aug. 1954, A. Hoogerwerf (ML).

Bali: 2 ♂ Den Pasar, 1 June 1935, R. Awibowo (ML).

Lombok: 1 ♂ Sapit, 2000 ft., April 1896, H. Fruhstorfer (CU); 1 ♀ "Lombok", Carl Aurivillius (NRS).

The specimens from Bawean, Kangean, Bali and Lombok agree in pattern with those from Java.

Sumbawa: see under subsp. *sutteri.*

Flores: 1 ♀ Boa Wae, 450 m, 2 April 1957, A. M. R. Wegner (ML; mesepisternum with reduced yellow stripe, pronotum, petiole and hind legs as in subsp. *sutteri*); 1 ♀ Rana Mese, 22 Febr. 1927, B. Rensch (ZMB; mesepisternum with small yellow spots).

So long as the populations inhabiting these latter two islands are imperfectly known, it seems best to regard them as transitional between subsp. *madraspatanum* and *sutteri.*

Celebes: South Celebes, 1 ♂ "Celebes", no. 57-101, 1 ♀ "Mak" (= Makassar, leg. A. R. Wallace), 58-142 (BM); 1 ♀ Samanga, Nov. 1895, 2 ♀ Patunuang, Jan. 1896, H. Fruhstorfer (NMW), 1 ♀ Latimodjong Mts., Uru, 800 m, Aug.-Sept. 1930, G. Heinrich (ZMB), 1 ♀ Malino, 4000 ft., Jan. 1936, L. E. Cheesman (BM); 1 ♀ Palopo, Todjambu, July 1936, L. J. Toxopeus (MZB); 1 ♀ Sungguminasa, Aug. 1949, C. J. H. Franssen (ML). — Yellow markings slightly more extensive than in Javan specimens: band on pronotum wide, hardly interrupted in the middle; gastral petiole not blackened at apex; only the basal fourth to third of fore and mid femora black; all basitarsi yellow, black at apex, hind basitarsus also slightly fuscous at base.

In the specimens available for study the pattern appears to be fairly constant, but examination of a more extensive material is desirable.

Buru: 1 ♀ 2 ♂ Balabalu, 6—10 June 1959 (MZB; ML).

Ambon: (Amboina): 1 ♀ "Amb.", leg. Wallace, coll. Saunders (OUM); 1 ♀ Kudamati, 1 ♂ Soja, April 1941, E. Lundquist (MZB); 7 ♀ 4 ♂ Waai, 14—23 July 1959, 3 ♀ do., Dec. 1960, 1 ♀ do., Jan. 1961, 3 ♂ do., Febr. 1964, A. M. R. Wegner (MZB; ML).

The specimens from Buru and Amboina agree in all details with those collected in Java. We regard this as an indication that the species has been introduced into these islands by human agency.

Sceliphron madraspatanum andamanicum (Kohl)

Sceliphron (*Pelopoeus*) *madraspatanum* var. *andamanica* Kohl, 1918, Annln naturh. Mus. Wien 32: 109 — "Andamanen Insel" (ZMB) [*andemanicum* (!) in index, p. 169].

In this subspecies the thorax is black, except for a small yellow spot on the tegulae. This appears to be the usual pattern of the species in the Andaman and Nicobar Islands. Occasionally populations in other localities produce specimens which approach this extreme degree of melanism rather closely. Kohl (1918) recorded a specimen from Borneo which had the thorax black, except for markings on tegulae and postscutellum,

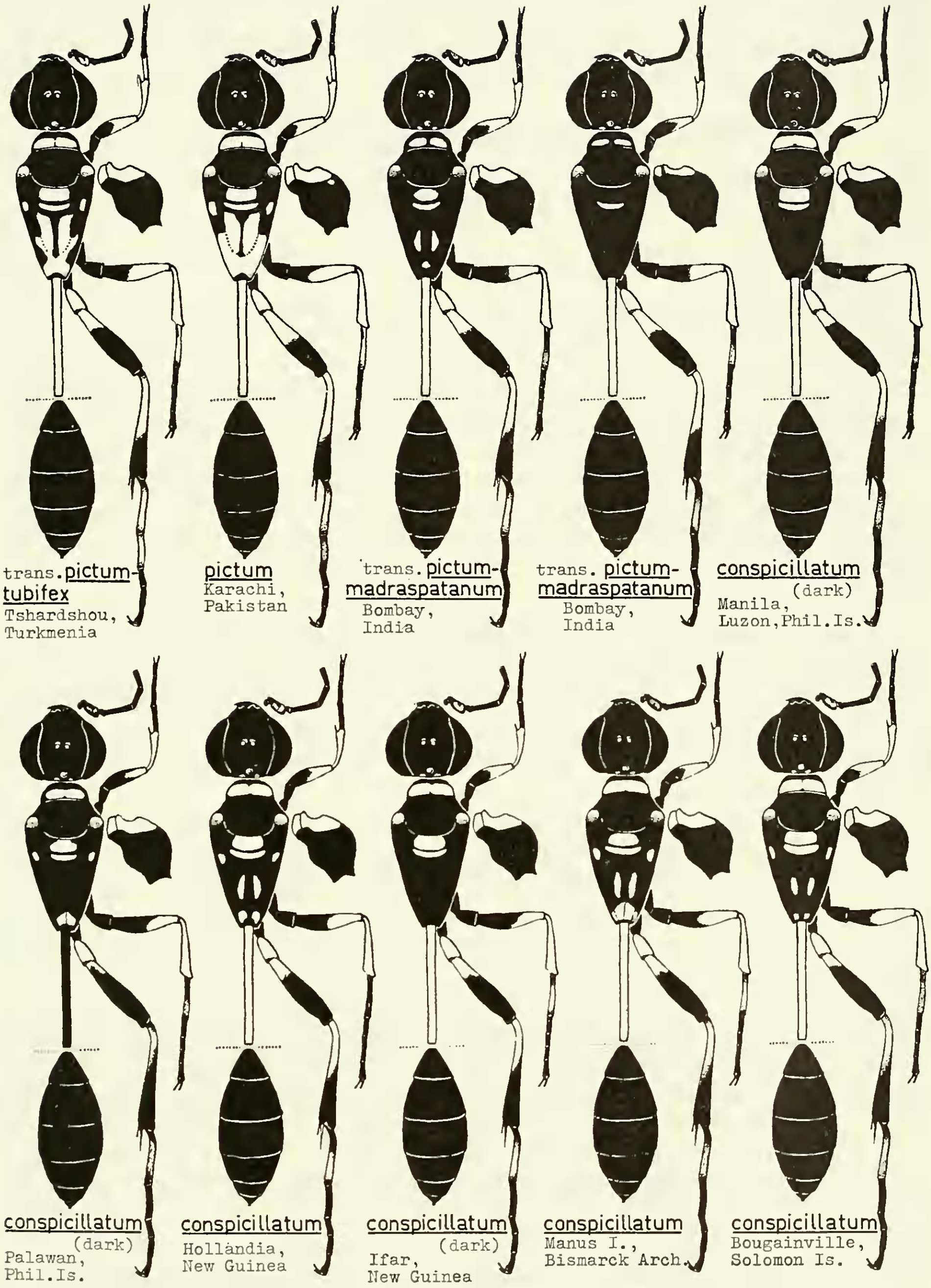


Fig. 12. Variation of some subspecies of *Sc. madraspatanum* (F.)

and the Leiden Museum possesses a similarly coloured specimen from Blangkassi in Thailand.

Andaman Is.: 1 ♂ N. Passago Island, G. Rogers (BM, no. 1906-204).
Nicobar Is.: 3 ♀ 1 ♂ Nicobar Is., leg. Roepstorff (UZMC; 1 ♀ ML).

Sceliphron madraspatanum conspicillatum (Costa)

Pelopoeus conspicillatus Costa, 1864, Ann. Mus. zool. Napoli 2 (1862): 112, ♀ — "Luzon", Philippine Islands (? type in Mus. Naples). — Kohl, 1918: 109 (in synonymy of *Sc. madraspatanum* (Fabr.)).

Sceliphron maderospatanum (!); Williams, 1919, Bull. Hawaii. Sugar Pl. Ass., Ent. Series 14: 123 (bionomics in Luzon).

Sceliphron conspicillatum; Rohwer, 1921, Phil. Jl. Sci. 19: 675 (Luzon; Leyte; Palawan).

Sceliphron madraspatanum; Krombein, 1949, Proc. Hawaii. ent. Soc. 13: 387 (Caroline Is.).

According to the original description the propodeum of the type(s) is entirely black. In several localities in the Philippine islands specimens with this character have been collected together with individuals with one to three pairs of yellow spots on the propodeum. Assuming that the presence of three pairs of spots is the "normal" condition, one may observe that reduction of these spots does not always proceed in the same way. Sometimes all the spots are more or less strongly reduced simultaneously, but usually the spots on the dorsum are the first to disappear and those at the apex the last; we have seen, however, a few specimens with only dorsal and apical spots, and one female with only a pair of dorsal spots. In very brightly coloured specimens the apical spots may become fused, or some additional spots may develop (Fig. 10 and 12).

A dark form occurs in Palawan, where the gastral petiole is as a rule partly or entirely black above, with a more or less distinct yellow line (sometimes lacking) on the under side. Even in such dark specimens the propodeum usually bears at least one or two pairs of yellow spots.

Specimens collected in 1955 and subsequent years in New Guinea (Hollandia and environs) and some neighbouring islands undoubtedly belong to the Philippine subspecies. Since there are no earlier records of *Sc. madraspatanum* from the Papuan area, it is practically certain that they are descendants of wasps accidentally introduced by plane (or, less likely, by boat) from the Philippine Islands during or shortly after the second world war.

Luzon: 4 ♀ 3 ♂ "Luzon" (ZMB; propodeum with 3 pairs of spots in 3 ♀, one pair in 1 ♀ 1 ♂, black in 2 ♂). — Tarlac Prov., 1 ♀ 1 ♂ Luista east of San Miguel, 13 Oct. 1945; Rizal Prov., 2 ♀ 1 ♂ Wackwack, 12—13 Sept. 1945, 1 ♂ Maly, 7 Oct. 1945; Pampanga Prov., 1 ♂ near Santa Cruz, 16 Sept. 1945, all leg. Richard P. Dow (MCZ; in most specimens markings of propodeum more or less reduced, absent in one ♀). — Laguna, Los Baños, 3 ♀ 2 ♂ 1915—1919, Coll. of Agric., C. F. Banks, and F. X. Williams, 1 ♂ do., July 1935, W. F. Jepson (ML; propodeum in 1 ♀ 1 ♂ with three pairs of spots, in the ♂ with additional spots on pronotum and propodeum; in 1 ♀ 1 ♂ with 2 pairs and in 1 ♀ 1 ♂ with apical spots only). — 10 ♀ 17 ♂ from Manila, Antipolo, Montalban, and several other localities, 1952—1954, Miss C. Baltazar and co-workers (BPI; propodeum in 1 ♀ 4 ♂ with 3 spots, in 3 ♂ with 2 spots, in 6 ♀ 2 ♂ with 1 spot, in 3 ♀ 8 ♂ black). — Mountain Province, 1 ♂ Babalasan, Kalinga, 5 March 1953, Marjorie C. Townes (ML; propodeum black, hind trochanter black with narrow apical yellow ring, hind femur black with similar ring at base); 3 ♀ "Fillipinerne", 3500 ft., ca. 1 June 1957, leg. Tage Ellinger (UZMC; 1 ♀ ML; propodeum in 1 ♀ with two small apical spots, in 2 ♀ black). — 1 ♀ Rizal Prov., Novaliches, 8 Dec. 1930 (CU); 1 ♂ Rizal, Theresa, 25 July 1952, H. Townes (coll. Townes; propodeum black); 1 ♀ Bacio (CU; propodeum black); 2 ♂ Los Baños, Sept. 1959, C. M. Yoshimoto (BISH; propodeum in 1 ♂ with apical spots only, in 1 ♂ black); 1 ♀ 1 ♂ Manila, Aug.-Sept. 1945, H. E. Milliron (BISH; propodeum black); 1 ♂ Bauang, 2 Oct. 1945, H. E. Milliron (BISH; propodeum black); 1 ♀ Mt. Makiling, F. C. Hadden (CAS), 1 ♂ Laguna, Pangil, May 1931 (CAS; propodeum black); 3 ♂ Alabang, April 1930, J. Valdez (CAS; propodeum in 2 ♂ with 2 pairs of spots, in 1 ♂ black); 2 ♀ do., Oct.-Dec. 1930, G. Merino (USNM); 1 ♀ Lucban, Tayabas, 24 May, R. C. McGregor (USNM).

Samar: 2 ♀ July 1924, Wright (CU; propodeum black), 1 ♀ Malaguinao, 22 April 1952, E. S. Gachalian (BPI; propodeum black).

Mindanao: Davao Prov., 1 ♀ Calian, July, 1 ♀ Lawa, April, C. S. Clagg (MCZ; propodeum with three pairs of spots); 1 ♀ Agusan, Santiago, April 1931 (CU; propodeum with dorsal and apical spots); 1 ♀ 1 ♂ Obrando, 24 Sept. 1919 (lot 500, sub 223) (CU; propodeum in ♀ with dorsal spots and one large apical mark, in ♂ black); 1 ♀ Lagao, 17 Jan. 1954, H. Townes (coll. Townes).

Palawan: 1 ♀ 1 ♂ Babuyan, 1 ♂ Inagawan, 1 ♂ Pt. Princesa, Dec. 1952, H. Townes (coll. Townes; ML; gastral petiole black, propodeum with basal and apical spots); 3 ♀ Brookes Point, Uring Uring and Makagwa, 22 Aug. 1961, Noona Dan Exp. (UZMC; 1 ♀ ML; propodeum with small basal spots and one apical spot in 2 ♀, with only the apical spot in 1 ♀; gastral petiole black with yellow line on under side, in one ♀ also yellow above at base).

West New Guinea: Vogelkop Peninsula, 1 ♂ Sorong, 21 March 1952, L. D. Brongersma (ML); Hollandia, 2 ♀ Jan. 1956, 1 ♀ April 1959, R. T. Simon Thomas, 5 ♀ 2 ♂ Jan. and Febr. 1956—June 1958, G. den Hoed (ML; 1 ♀ 1 ♂ coll. van Lith), 2 ♀ 15 and 16 March 1959, L. D. Brongersma (ML); Ifar, 350 m, 5 ♀ Dec. 1956—March 1959, J. van den Assem (ML), 1 ♀ 450 m, N. of Lake Sentani, Nov. 1955, L. D. Brongersma c.s. (ML). — Pattern fairly constant, except for the propodeum, which varies from black (1 ♀) via one (6 ♀) or two pairs of spots (4 ♀) to three pairs (4 ♀ 1 ♂); one female has only the dorsal spots left, but in the other specimens with only one pair of spots the basal and dorsal spots are lacking.

Territory of New Guinea: 1 ♂ Maprik, 20 Oct. 1957, J. Smart (BM).

Bismarck Arch.: 1 ♀ Manus Island, Lorengau near sea level, 15—25 Dec. 1959, T. C. Maa (BISH; Fig. 12). — New Britain, 2 ♀ Keravat, 17 Nov. 1957, 1 ♀ 3 ♂ Puktas, Baining Mts., 22 Nov. 1957, J. Smart (BM).

Solomon Is.: 1 ♀ Buka Island, 27 Oct. 1960, R. W. Paine (ML; propodeum with three pairs of spots); 1 ♀ Bougainville, Tokinoitu, 20 m, 2 June 1956, J. L. Gressitt (BISH; Fig. 12).

Caroline Is.: common in the Palaus, probably introduced during the war; see Krombein, 1949.

Sceliphron madraspatanum sutteri van der Vecht

Sceliphron madraspatanum sutteri van der Vecht, 1957, Verh. naturf. Ges. Basel 68: 368, ♀ ♂ — "Sumba, Waikarudi" (type ♀, NMB).

This subspecies was described from a series of over 160 specimens from Sumba. Four females from Sumbawa were regarded as paratypes, but only two of these had complete yellow spots on the mesepisternum. It seems possible that examination of more material from this island will show that the population as a whole is intermediate between the subspp. *madraspatanum* and *sutteri*, or even that it is closer to the former.

Sceliphron (Sceliphron) intrudens (Smith)

Pelopoeus intrudens Smith, 1859, J. Proc. Linn. Soc., Zool. 3: 15, ♀ ♂ — "Celebes", leg. Wallace (lectotype ♀, BM).

Sceliphron (*Pelopoeus*) *intrudens*; Kohl, 1918, Annln naturh. Mus. Wien 32: 110.

This species superficially resembles *Sc. javanum*, but it is more closely allied to *Sc. madraspatanum*. In fact, it may be regarded as the modified descendant of a *madraspatanum* ancestor which reached Celebes at an early date.

The female with label "Mak. 58/142" in the British Museum is herewith designated as the lectotype.

Celebes: many specimens with label "Celebes" only (BM, MCG, ML, MP, UZMC). — North Celebes: 2 ♀ "North Celebes" (MZB), 9 ♀ 4 ♂ Minahasa, coll. Gribodo (MCG, 1 ♀ ML). — Central Celebes: 1 ♀ Luwu, Masamba, April 1941, L. Maurenbrecher (MZB); 2 ♀ 2 ♂ Pendolo, Lake Poso, 650 m, Febr. 1950, C. J. H. Franssen (ML); 6 ♀ 1 ♂ Palu, Dec. 1936 (ML), 1 ♀ 2 ♂ Palu (MZB); 1 ♀ Ampana, 30 Sept. 1952 (ML). — South Celebes: 1 ♀ 2 ♂ Sengkang, Sept.-Oct. 1930, J. van der Vecht (ML); 1 ♀ 1 ♂ Pinrang, 29 May 1948, J. van der Vecht (ML); series from Samanga, Nov. 1895, and Patunuang, Jan. 1896, H. Fruhstorfer (NMW; MP; 1 ♀ 1 ♂ IRSNB; 1 ♀ CU); 1 ♀ 2 ♂ Latimodjong Mts., Uru, 800 m, Aug.-Sept. 1930, G. Heinrich (ZMB), 1 ♀ Latimodjong Mts., Bontu-Batu district, 4000 ft., 19—25 May 1931, C. F. Clagg (MCZ); 1 ♀ Bantimurung, 25 May 1930, G. Heinrich (ZMB); 2 ♀ 4 ♂ Bantimurung, June 1948, J. van der Vecht (ML); 1 ♀ Maros, leg. Albrandt (NMW); 1 ♀ 1 ♂ "Mak. 58/142" (= Makassar, leg. Wallace) (BM, incl. the lectotype, ♀); 2 ♂ "Mak." (= Makassar, leg. Wallace) (OUM), 3 ♂ "Makapar" (= Makassar), 23 April and 16—17 May 1906, ex coll. Bingham (ML), 1 ♀ Makassar, Dec. 1908, F. Muir (ML), 2 ♀ Makassar, April 1949, C. J. H. Franssen (ML), 1 ♂ Makassar, T. Barbour (MZC), 1 ♂ Makassar, 1905, from Shelford (BM); 1 ♀ Malino, 4000 ft., Jan. 1936, L. E. Cheesman (BM); 3 ♀ 2 ♂ Lompoh Batang, 200 m, Nov. 1941, H. Lucht (ML); 2 ♀ 1 ♂ Tanete, March 1949, C. J. H. Franssen (ML). — 1 ♀ "Ile Moena, Raha" (IRSNB). — 1 ♂ Kalao Is., 12-99, ex coll. Bingham (BM, 1902-120).

Note: "*Sceliphron intrudens*" Bingham, 1897, is evidently *Sc. javanum* (Lep.); "*Sceliphron intrudens* var." Williams, 1919, p. 120, is the Philippine subspecies of *Sc. javanum* (Lep.).

Distribution. — *Sc. intrudens* (Smith) appears to be restricted to Celebes and some of the neighbouring smaller islands.

Sceliphron (Sceliphron) quartinae (Gribodo)

Pelopoeus quartinae Gribodo, 1884, Annali Mus. civ. Stor. nat. Genova (2) 1: 298 — "Scioa, Let-Marefià" (18 ♀ 9 ♂), "Daimbi" (1 ♀) (MCG). — Schulz, 1911, Zool. Ann. Würzburg 4: 159 (additional description of syntypes in Mus. Genova).

Sceliphron fulvohirtum Arnold, 1928, Ann. Transvaal Mus. 12: 236 (in key), 246, ♀ ♂, Fig. 4 — "Sanyati River, S. Rhodesia", R. H. R. Stevenson (types in coll. Stevenson); also 1 ♂ from Umtali, S. Rhodesia. — Id., 1951, Bull. Br. Mus. nat. Hist., Ent. 2 (3): 139 (4 ♂, Lekempti, Ethiopia). — Leclercq, 1955, Expl. Parc Nation. Upemba, Mission G. F. de Witte, etc. 34: 58 (six localities) [new synonymy].

The type locality "Let Marefià" is situated in Shoa, Ethiopia, about 16 km North of Ankober (9.32 N, 39.43 E). We have recently examined 1 ♀ 1 ♂ of the original series of syntypes and designated the ♀ as the lectotype.

Gribodo's species has not been recognized by Kohl, who in 1909 incorrectly applied the name *quartinae* to the species discussed in this paper under the name *Sc. fossuliferum*. Brauns (1911) followed him in this respect (see the references in Kohl, 1918: 105). Arnold (1928) also misapplied the name *quartinae*, but simultaneously he described some specimens from Southern Rhodesia as a new species (*fulvohirtum*), without realizing that they were very similar to the true *quartinae* from Ethiopia. When in 1952 Arnold examined some syntypes of Gribodo's *quartinae*, he admitted to have misidentified this species, but stated his *Sc. fulvohirtum* to be different: "*Sc. fulvohirtum* is closely related to this species, but is larger and has a longer and more oblique pronotum. The genitalia, although similar, have the outer paramera narrower apically and the sagittae are of a different shape." The accompanying drawings of the genitalia, however, are rather coarse, and in our opinion do not convincingly indicate that the two forms are specifically different.

After having studied a series of specimens of *Sc. quartinae* from various localities, we have reached the conclusion that *Sc. fulvohirtum* is not specifically different from Gribodo's species. It is true that the type localities are far apart, but *Sc. quartinae* is now known from several intermediate localities. Moreover, Arnold himself in 1951 identified some specimens from Ethiopia as belonging to his *Sc. fulvohirtum.*

The specimens examined by us agree well with the types; there is some variation in the pubescence of head and thorax, which in the types appears to be somewhat longer and denser than in several other specimens. The available material is partly worn, however, and does not permit to determine whether this character is subject to geographic variation. The shape of the pronotum is somewhat variable, but it is always more swollen than in *Sc. fossuliferum* and *madraspatanum.*

Cameroon: Uam-area, Bosum, 3 ♀ 21—30 April 1914, 7 ♂ 11—20 June 1914, leg. Tessmann (ZMB; 1 ♀ 2 ♂ ML).

French Sudan: 1 ♀ Middle Niger, Diafarabe, May 1932, O. B. Lean (BM).

Ethiopia: Let Marefià (syntypes of *Sc. quartinae*; MCG, NMW and MP); 4 ♂ Lekempti (BM; see Arnold, 1951).

Uganda: 1 ♂ Mbale-Kami Rd., 3700 ft., S. of L. Salisbury, 15—17 Aug. 1911, S. A. Neave (BM); 1 ♀ Katona, Mto-ya-Kifaru (MBUD); 1 ♂ Katona, Mujenje, Aug. 1913 (MBUD).

Kenya: 1 ♀ Nandi Plateau, 5700—6200 ft., 30 May—4 June 1911, S. A. Neave (BM); 1 ♀ Crater Lake 9 miles N.W. of Meru, 5700 ft., 15 Febr. 1911, S. A. Neave (BM); 1 ♂ L. Baringo, 1931, E. B. Worthington, Cambridge Univ. Exp. (BM).

Tanganyika: "Matengo Hochland, WSW. von Songea, Ugano", 2 ♀ 1 ♂ Dec. 1935—March 1936, leg. Zerny, 1 ♀ 22 Jan. 1938, F. Zimmer (NMW; 1 ♀ ML); 1 ♀ 1 ♂ S.W. Sagalla Swamp, Mpembene, 3760 ft., 15 Oct. 1947, 1 ♂ Malagarasi, 100 mls. E. of Kigoma, 3730 ft., 7 Nov. 1947, M. Steele (BM).

Congo: 1 ♀ Katanga, Tenke, 30 July—9 Aug. 1931, J. Ogilvie (BM). Recorded from Boma, Mwashya, Katanga, and Bolobo by Leclercq (1955).

Zambia: recorded from Abercorn (N. Rhodesia) by Leclerq, 1955.

Nyasaland: 1 ♂ Chitala Stream, 10 m West of Domita Bay, 22—28 Oct. 1910, S. A. Neave (BM; posterior surface of propodeum with transverse yellow spot).

Rhodesia: 1 ♀Matetsi, 6 Nov. 1934, R. H. R. Stevenson (BM; "compared with type [of *fulvohirtum*] in coll. Stevenson"), 1 ♀ Bulawayo, 10 Dec. 1931, R. H. R. Stevenson (BM); 1 ♂ Bambesi R. (BM).

South Africa: 1 ♀ Cape of Good Hope (ML); 1 ♀ Cape Province, Huguenot, Febr. 1932, Miss A. Mackie (BM); 2 ♀ 3 ♂ Wellington, Rooshoek, Jan.-Febr. 1960, A. Mirjam Verhoeff (PV). Recorded from Pietermaritzburg and Algoa Bay by Leclercq, 1955.

Variation. — The Museum at Budapest possesses a male from "D.O. Afrika, A. Böttcher", which is remarkable for the unusual colour pattern. The pronotum has a dorsal yellow band, furthermore are yellow: the tegulae, two small spots on the mesepisternum beneath the tegulae, a spot on the scutellum and a rather large spot at the apex of the propodeum.

The pattern is very similar to that of certain forms of *Sc. madraspatanum*; the structure of the pronotum and the sculpture of the propodeum leave no doubt, however, that this specimen belongs to *quartinae.* It is impossible to say whether this is an individual aberration or a representative of a population which is constantly more extensively marked with yellow.

Sceliphron (Sceliphron) fossuliferum (Gribodo)
(= *Sceliphron quartinae* auctt., nec Gribodo)

This is the commoner of the two representatives of the *madraspatanum*-group in the Ethiopian region.

For a long time this species has been called *quartinae*, but this error was corrected by Arnold (1952), who examined some of Gribodo's "cotypes" (syntypes). However, this author failed to discover that *Sc. fossuliferum* (Gribodo) is the same as *quartinae* auctt. nec Gribodo. The name *decipiens*, proposed by Arnold (1952) for the species erroneously described by him in 1928 as *quartinae*, is therefore superfluous.

We agree with Leclercq (1955) that *Sc. voeltzkowii* Kohl may be regarded as a subspecies of *Sc. quartinae* auctt., but we prefer not to follow him in treating *voeltzkowii* Kohl and *complex* Kohl as identical. These names were based on specimens showing distinctly different degrees of melanization, and as there are indications that this variation is at least to some extent correlated with the geographic and the vertical distribution (melanism apparently being more common in mountain areas), the names may prove useful in further studies of the relationships. It should be noted that the pigmentation of *Sc. masaicum* Turner is practically identical with that of *Sc. voeltzkowii* Kohl, and not with that of *Sc. complex* Kohl, as suggested by Arnold (1928: 246).

The typical form appears to occur throughout the entire Ethiopian region. According to Arnold (1928) it occurs in East Africa from Sudan to Port Elizabeth and has also been recorded from West Africa, Transvaal and Sicily [the latter record is certainly incorrect!]; Leclercq (1955) has recorded it from Ethiopia, Congo, and Cape of Good Hope.

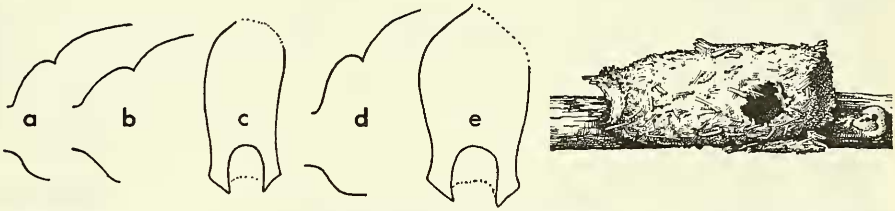
The specimens listed below have been examined by us in the last two years; previously the senior author has identified many specimens in the museums of London, Paris, and Vienna as "*quartinae*", but this material should be checked, for it seems now possible that a few specimens will prove to belong to the true *Sc. quartinae*.

In the key on p. 193 *Sc. fossuliferum* is separated from the closely allied *Sc. madraspatanum* by the colour of the tegulae. If this was the only difference, these two allopatric forms could hardly be regarded as specifically distinct. In addition to certain differences in sculpture and pubescence, however, we found that the male genitalia, although very similar, can be readily distinguished. In specimens of *Sc. madraspatanum* from various parts of its extensive range the pubescence of the volsella was constantly found to be longer than in *Sc. fossuliferum* (Fig. 5 and 6).

It is of interest to note that the American species agree in this respect with *Sc. madraspatanum*, whereas in the other African species, *Sc. quartinae* (Grib.), the pubescence is as short as in *Sc. fossuliferum*. This appears to support our view that *Sc. madraspatanum* and *fossuliferum* are different species.

Bionomics. — According to Brauns (1911: 119) *Sc. quartinae* Grib. builds its cells on grass stems and branches, either singly or in pairs; at Port Elizabeth the cells are made of moist loam, but at Delagoa Bay in Mozambique the wasps used moist dung for this purpose. It seems now practically certain that the nests observed by Brauns at Delagoa Bay were constructed by *Sc. fossuliferum*; whether this species uses clay or loam for building its cells as well as dung, deserves confirmation. The possibility exists that the nests found by Brauns at Port Elizabeth were constructed by the true *Sc. quartinae* (nec auctt.).

Kohl (1918, Pl. II, Fig. 11: 153) published a figure of a nest of "*Sc. quartinae* Grib. (oder *spirifex* L.)", built on a branch and consisting of cow dung ("Rinderkot"). This nest seems to contain two cells, but Mayer and von Schulthess (1922) state that the nest sent by them to Kohl and figured by this author consisted of three cells; it was collected by Junod at Shilouvane in Northern Transvaal. Afterwards Junod collected at Rikatla and Delagoa Bay two more nests of cow dung, both of four cells, one built on a palm leaf (figured on the accompanying plate, Fig. 4 = Fig. 1 in "Erklärung") and one on a branch of a shrub. In 1947 Dr. Burtt found such cells in Tanganyika (our Fig. 13).



Sc. quartinae (Grib.)
a,c: Wellington, S. Africa
b Uam-area, Cameroon

Sc. fossuliferum (Grib.)
Katona, Uganda

Sc. fossuliferum (Grib.)
cell of manure on branch
Tanganyika

Fig. 13. African species; a, b, d: outline of pronotum and anterior part of mesoscutum (lateral view), c, e: dorsal view of left hind coxa.

The following key may serve to distinguish the three subspecies recognized in this paper.

1. Gastral petiole entirely yellow. Antennal scape black. Apex of femora and most of the tibiae of fore and mid legs yellow (mid tibiae, and often also the fore tibiae, with dark spot of variable size at apex); trochanters, basal half of femora and basal half (or more) of tibiae of hind legs yellow . . . . . . *fossuliferum* (Gribodo)

— Gastral petiole partly black. Antennal scapes usually partly or entirely dark red. Legs less extensively marked with yellow 2

2. Approximately the basal half to two-thirds of the petiole yellow. Fore and mid legs black, partly reddish, base of tibiae sometimes partly yellow; hind legs as in *fossuliferum*, but the tibiae only with yellow ring at the base. — Mainly in the mountains of East Africa . . . . *voeltzkowii* Kohl

— At most the basal third of the petiole yellow. Legs black, only hind trochanters and approximately the basal one-fourth of the hind femora yellow; fore femora and tibiae partly reddish. — Mainly in West Africa (?) . . . . *complex* Kohl

Sceliphron fossuliferum fossuliferum (Gribodo)

Pelopoeus fossuliferus Gribodo, 1895, Memorie R. Accad. Sci. Bologna (5) 5: 110, ♀ — "Rikatla", Mozambique (MCG).

Sceliphron (*Pelopoeus*) *fossuliferum*; Kohl, 1918, Annln naturh. Mus. Wien 32: 135 (unidentified species; incorrectly on p. 105 in synonymy of *Sc. quartinae*!). — Arnold, 1952, Occ. Papers Nat. Mus. S. Rhodesia 2 (17): 480, ♂, F. 17 (Portuguese East Africa).

Sceliphron quartinae; H. Brauns, 1911, Z. wiss. InsektBiol. 7: 119 (bionomics) [misidentification]. — Kohl, 1918, Annln naturh. Mus. Wien 32: 105, ♀ ♂ [misidentification; probably mixed up with true *Sc. quartinae*]. — Mayer & von Schulthess, 1922, Mitt. Ent. Zürich, Heft 6: 364 and plate (notes on nests). — Von Schulthess, 1926, Verh. III Intern. Kongresz 2: 21. — Arnold, 1928, Ann. Transvaal Mus. 12: 245, ♀ ♂, Figs. 3, 4a.

Sceliphron quartinae quartinae; Leclercq, 1955: 59 (Congo; Ethiopia; Cape of Good Hope).

Sceliphron decipiens Arnold, 1952, Occ. Papers nat. Mus. S. Rhodesia 2 (17): 482 (new name for *Sc. quartinae* sensu Arnold, 1928, nec Gribodo; type ♀, Unyoro, Uganda, in NMSR) [new synonymy]).

Senegal: 1 ♂ Diafarabe, 14 Aug. 1944, K. M. Guichard (BM).

Ghana: 1 ♂ "Gold Coast", N. Territories, Prang, 9 Febr. 1913, J. J. Simpson (ML).

Sudan: 2 ♀ W. Darfur, E. Jebel Murra, Kirima, 5525 ft., 20 May 1932, M. Steele (BM).

Ethiopia: 1 ♀ Sidamo, 25 Febr. 1912, 2 ♂ Tshertsher, Oct. 1911, Kovacs (MBUD).

Uganda: 1 ♀ Mbale-Kami Road, 3700 ft., S. of Salisbury, 15—17 Aug. 1911, S. A. Neave (ML); 1 ♂ Entebbe, Nov. 1912, G. C. Gowdey (ML); Katona, 2 ♀ 2 ♂ Mto-ya-Kifaru, 1 ♀ 1 ♂ Shirati, 1909 (MBUD; ML).

Tanganyika: 1 ♀ leg. W. A. Collier (ML); 1 ♂ "Dtsch. O. Afrika" (ML); 4 ♂ Shinyanga, 23 July 1947, "on manyava", from cells of dung attached separately lengthwise to a branch (Fig. 13), Dr. E. Burtt (BM, Comm. Inst. Ent. no. 10878); 3 ♀ S.W. Sagalla Swamp, Mpembene, 3760 ft., 15 Oct. 1947, waterhole, M. Steele; 1 ♂ S.W. Sagalla Swamp, Chunge, 3780 ft., 25 Oct. 1947, M. Steele; 1 ♂ Malagarasi, 100 mls. E. of Kigoma, 3730 ft., 7 Nov. 1947, M. Steele (BM).

Congo: 1 ♀ Elizabethville, 11 Sept. 1931, J. Ogilvie (BM).

Zambia: 2 ♂ "N.E. Rhodesia", Upper Luangwa R., July-Aug. 1910, S. A. Neave (BM; ML), 1 ♂ do., Mid Luangwa R., Aug. 1910, S. A. Neave (ML).

Malawi: 1 ♂ Chitala Stream, Domira Bay, 22—28 Oct. 1910, S. A. Neave (BM); 1 ♂ Mbamba Bay, 12—16 April 1936, leg. Zerny (NMW).

Rhodesia: 1 ♀ 1 ♂ leg. H. S. Leeson (BM); 1 ♀ Shangani, De Beer's Ranch, May 1962, J. Ogilvie (BM).

Mozambique: 1 ♀ Delagoa (*quartinae* Grib., det. Kohl) (MBUD).

Sceliphron fossuliferum voeltzkowii Kohl

Sceliphron (*Pelopoeus*) *voeltzkowii* Kohl, 1909, in Voeltzkow, Reise in Ostafrika 2: 370, ♀, Fig. 2 — "Chake-Chake (Pemba)", North West Tanganyika.

Sceliphron (*Pelopoeus*) *quartinae* var. *voeltzkovii* (!); Kohl, 1918, Annln naturh. Mus. Wien 32: 106. — Arnold, 1928, Ann. Transvaal Mus. 12: 245 (*voeltzkovii*(!); "race" of *Sc. quartinae*).

Sceliphron quartinae voeltzkovii (!); Leclercq, 1955: 59 (Cameroons; Congo).

Sceliphron masaicum Turner, 1919, Ann. Mag. nat. Hist. (9) 3: 393, ♀ — series from "British East Africa" (Kenya and Uganda); lectotype by present designation: Kenya, Ngare Narok, Masai Reserve, 31 Dec. 1913, A. O. Luckman (BM, type no. 21.607).

Nigeria: 1 ♀ Lagos, Ajouta(?), 29 Jan. 1957 (BM, 1959-107).

Kenya: series (incl. lectotype) from Ngare Narok, Masai Reserve, 31 Dec. 1913, A. O. Luckman (BM; antennal scape sometimes almost black); 1 ♂ Shimba, July 1912, Dr. A. D. Milne (BM, 1913-192).

Uganda: 1 ♀ Tero forest, S.E. Buddu, 3800 ft., 26—30 Sept. 1911, S. A. Neave (ML).

Tanganyika: 2 ♀ Tendaguru, 4—7 July 1924, W. E. Cutler (BM, 1930-489; 1 ♀ ML).

Malawi: 1 ♂ Nyasa Lake, Mbamba Bay, 12—16 April 1936, Zerny (NMW).

Sceliphron fossuliferum complex Kohl

Sceliphron (*Pelopoeus*) *complex* Kohl, 1918, Annln naturh. Mus. Wien 32: 107, ♀ — "Choutes (!) de Samlia River, N. Gamio (Mocquereys)". — Arnold, 1928, Ann. Transvaal Mus. 12: 246 (syn.: *Sc. massaicum* Turner).

Sceliphron (*Sceliphron*) *complex*; Leclercq, 1955: 59 (in synonymy of *Sc. quartinae voeltzkovii* (!) Kohl; Ruanda, Nyangwa, 2000 m).

Gabon: 1 ♀ Chutes de Samlia, Riv. N'Gamio, leg. Mocquereys (type, NMW).

Spanish Guinea: 3 ♀ "Alcu, Benito-Gebiet", Aug.-Sept. 1906, G. Tessmann (ZMB; 1 ♀ ML).

"West Afrika": 1 ♀ Uelleburg, G. Tessmann (ZMB).

2. New World species

The distribution of the American species of the *madraspatanum*-group is remarkable (Fig. 14). On the basis of morphological characters it is possible to distinguish six species. They can be arranged in two subgroups: (a) three "mainland species", inhabiting North, Central, and South America, respectively, and together forming one superspecies, and (b) three "insular species" which are almost restricted to the West Indian islands. These subgroups are not sharply separated. Both the North and the Central American species (*Sc. caementarium* and *assimile*, respectively) are also found on some of the West-Indian islands, and one of the insular species, *Sc. jamaicense*, appears to be only subspecifically different from a form which inhabits Lower California (*lucae*).

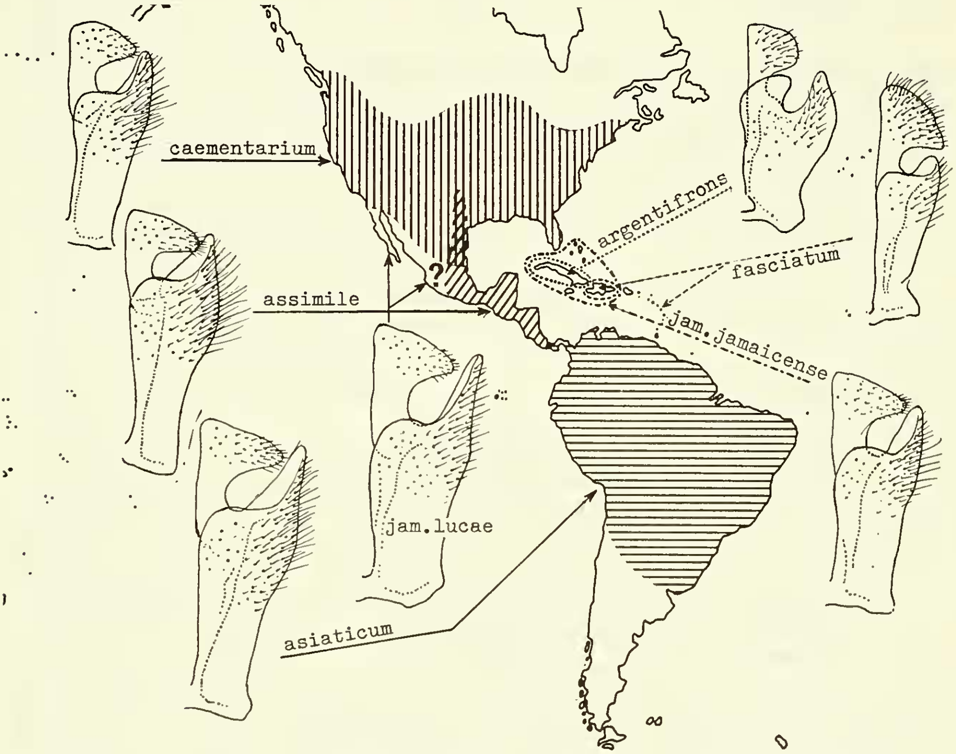
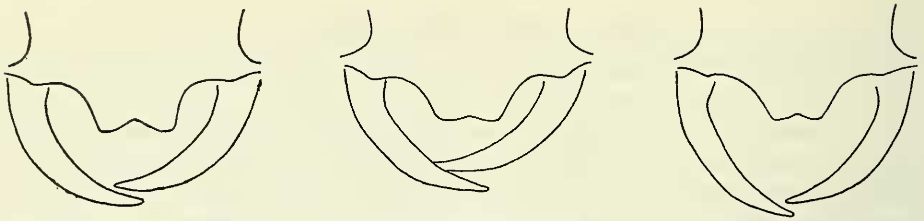
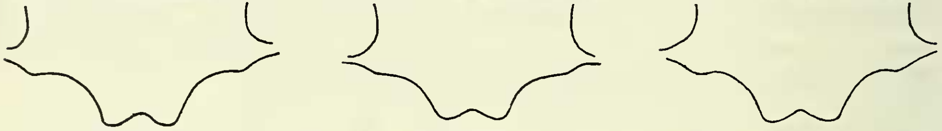


Fig. 14. Approximate distribution of the *madraspatanum*-group in the New World, with figures of the volsella of each species (cf. fig. 8). Cuba should be shaded like Central America.

In the greater part of the American area the group is represented by only a single species, in other words the species are mainly allopatric. But some localities, particularly in the West Indian islands, appear to be inhabited by more than one species. Three species have been recorded from Cuba (*Sc. assimile, argentifrons* and *jamaicense*), and from Mexico (*Sc. caementarium, assimile* and *jamaicense lucae*), but especially in the latter case the sympatric occurrence deserves confirmation; in Puerto Rico both *Sc. caementarium* and *assimile* have been collected recently; Jamaica appears to be inhabited by *Sc. assimile* and *jamaicense*, Hispaniola by *Sc. fasciatum* and *jamaicense*.

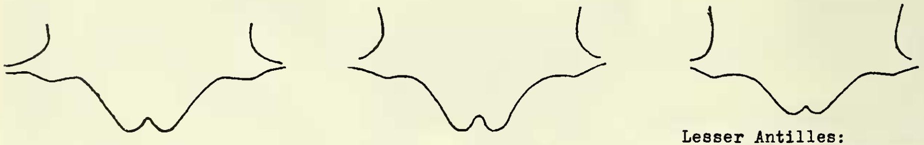


U. S. A., New Hampshire U. S. A., North Carolina U. S. A., California



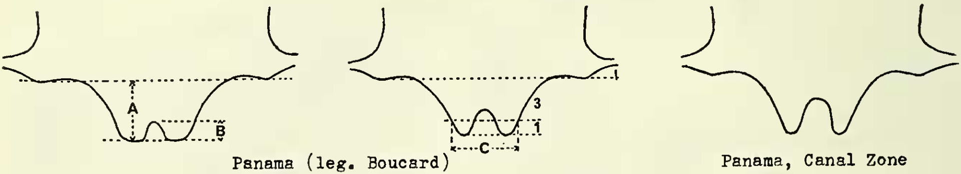
Bermuda Isl. Lesser Antilles: Montserrat (1965) Lesser Antilles: Guadeloupe

Sc. caementarium

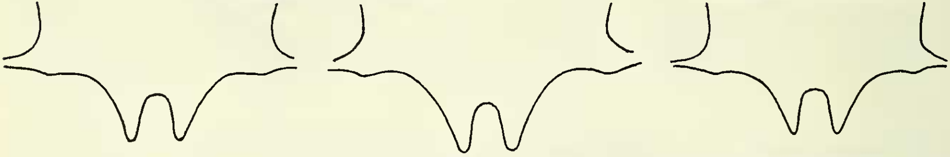


Cuba (type) British Honduras Lesser Antilles: Montserrat (1894)

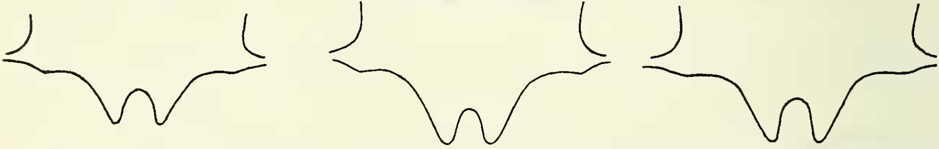
Sc. assimile



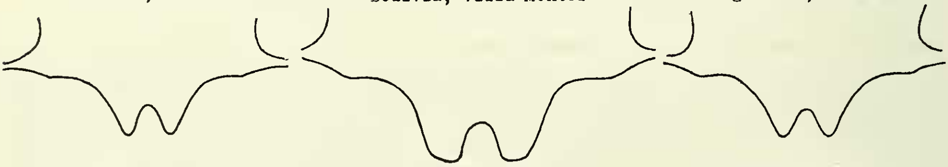
Panama (leg. Boucard) Panama, Canal Zone



Curaçao Suriname, Coronie Suriname, Marienburg



Brazil, Ceara Bolivia, Villa Montes Argentina, Mendoza



Argentina, Mendoza Chile, Cauquenés Chile, Santiago

Sc. asiaticum (= figulum)

Fig. 15. Anterior part of clypeus of the males of the three American mainland species

It must be remarked, however, that some of the observations are not synchronous and that the possibility of temporary and local, relatively short-lived, invasions should not be excluded. It would therefore be of particular interest to determine whether the absence of recent records of, for example, *Sc. assimile* in Texas and *Sc. fasciatum* in St. Vincent, really reflects the present distribution of these species. Especially in smaller islands the turnover may be relatively rapid (Mayr, 1965).

With regard to the distribution of the American species in general it is of interest to note that within ten years after the appearance of Darwin's "Origin of Species" H. de Saussure (1867) wrote: "Man sieht hier deutlich wie der amerikanische *Pelopeus* (sic!), indem er sich vom Norden nach Süden ausbreitete, sich erst in locale Varietäten auflöste, sich aber später in dem Maasse wie diese Varietäten auseinander gingen, zu förmlich gesonderten geographischen Arten gestalteten, welche nun durch neue Migrationen geographisch in einander greifen".

Since Porter (1926) differences in the shape of the clypeus have been used to separate the males of the three common mainland species. Kohl (1918) did not know the male of the Central American *Sc. assimile*, which in this respect is intermediate between the North American *Sc. caementarium* and the South American *Sc. asiaticum*. It has proved of interest to make a detailed study of the male clypeus and its variability in the American mainland species (Fig. 15). For this purpose we have measured the following variables:

A. the length of the anterior part of the clypeus, i.e. the portion protruding beyond a line through the blunt lateral angles (Fig. 15, top row of *Sc. asiaticum*),

B. the depth of the incision between the apical teeth (= the length of the apical teeth),

C. the width of the anterior part of the clypeus, measured at ¼ of its length from the apex.

In order to reduce the influence of the variation in size of the head, all measures have been expressed in percentages of the interocular distance at the clypeus.

The results of measuring A and B in the available males are shown in table 1 and in Fig. 16.

Table 1. Measurements of clypeus of males of three American species.

species	number	locality	A (length of anterior portion)	B (length of teeth)
Sc. caementarium	15	U.S.A.	20.7—24.4, av. 22.8	2.1— 6.2, av. 4.2
	10	Lesser Antilles	20.5—25.0, av. 22.5	4.1— 5.5, av. 4.7
Sc. assimile	10	Texas - Costa Rica	23.2—28.2, av. 25.7	4.4— 7.9, av. 5.7
	9	Cuba	23.4—27.0, av. 25.4	4.4— 6.7, av. 5.6
	7	Jamaica; P. Rico	23.0—26.2, av. 24.7	4.3— 5.6, av. 4.9
	20	Lesser Antilles	21.5—27.5, av. 24.4	2.5— 5.6, av. 4.4
Sc. asiaticum	3	Panama	26.6—28.1, av. 27.6	8.7—16.6, av. 12.6
	14	Colombia - Suriname	28.5—32.5, av. 30.1	18.1—22.8, av. 20.1
	12	Bolivia - Argentina	27.4—32.2, av. 28.5	11.6—20.9, av. 16.4

It appears from these figures that the anterior portion of the clypeus is relatively slightly longer in *assimile* than in *caementarium*, but that in general these two species are close together, and that there is a considerable amount of overlapping. The South-American *Sc. asiaticum*, although very variable, particularly in the length of the clypeal teeth, is distinctly separated from the two others.1)

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1) Apparently Kohl (1918) has overlooked that the two figures of the head of "*Sc. figulus*" in his paper (Fig. 31 and 59) differ considerably, at least he does not comment on this fact.

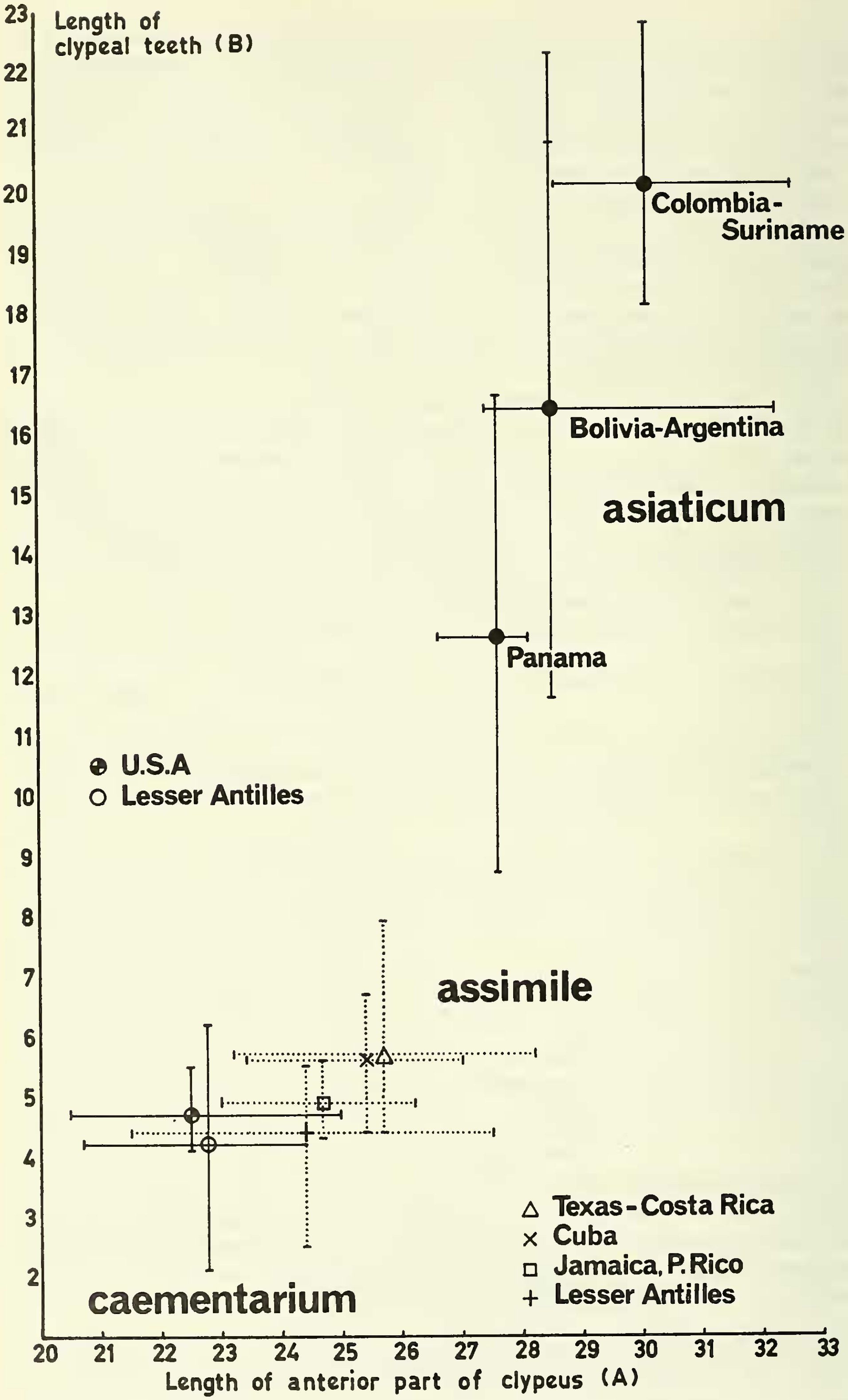


Fig. 16. Average and range of measurements A and B in ♂ of the three American mainland species

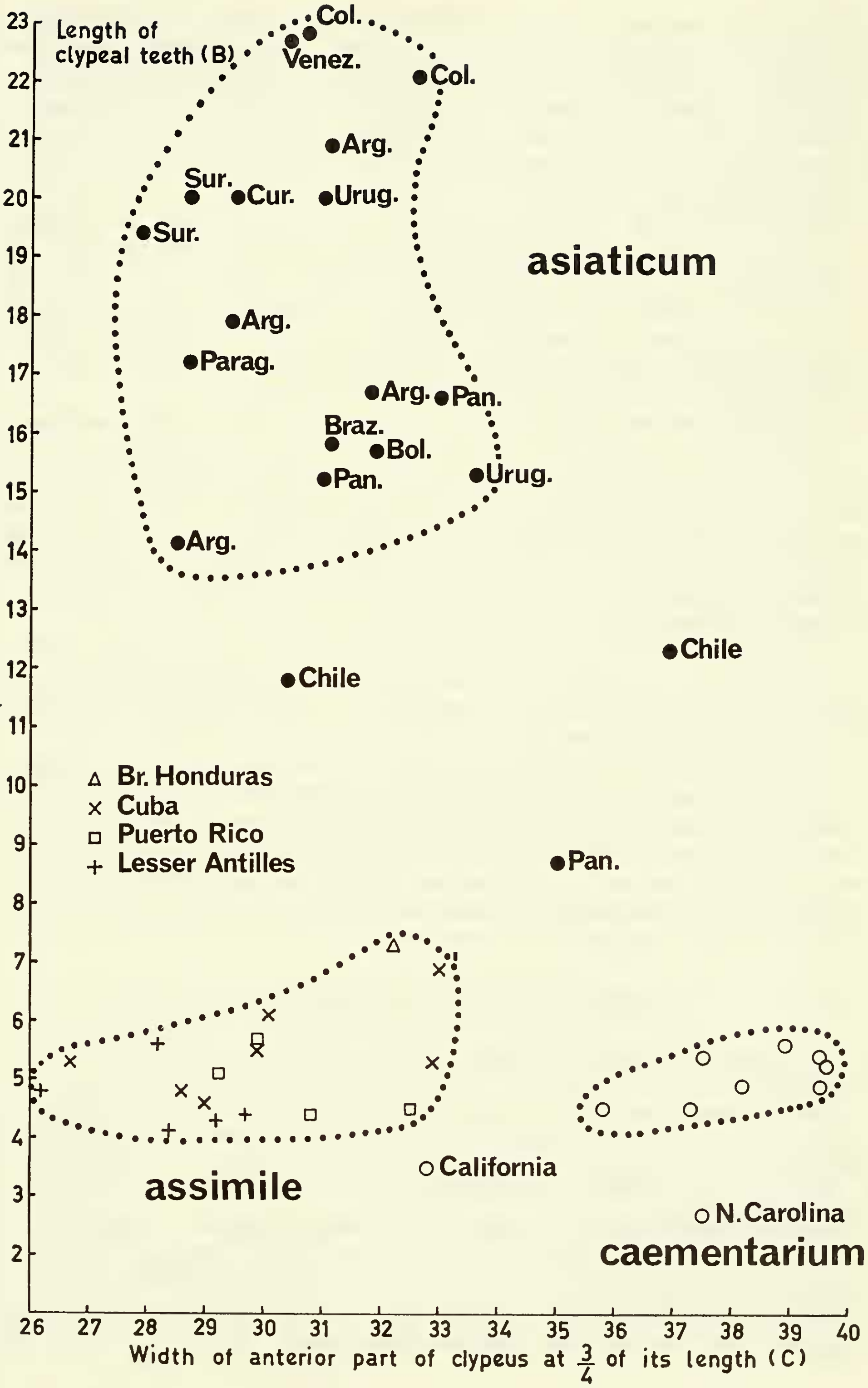


Fig. 17. Measurements B and C of males of the three American mainland species

The nature of the variation in *Sc. asiaticum* deserves some comments. The few available specimens from Panama (Fig. 15) seem to be transitional between *assimile* and *asiaticum* and suggest that in this area some hybridization may occur. In a series of specimens, here indicated as "Colombia-Suriname" and comprising three males from Colombia, one from Venezuela, three from Curaçao and six from Suriname, the clypeal teeth are without exception long and sharp, a condition which is only rarely found in males from the southern part of South America.

It is evident from Fig. 15 that *Sc. assimile* differs from *Sc. caementarium* in having the clypeus more strongly narrowed anteriorly. In order to express this difference we have measured the width of the anterior portion of the clypeus at three fourths of its length in a number of males of each of the three species. The results are shown in a diagram (Fig. 17), in relation to the length of the clypeal teeth, again expressed as percentages of the width of the smallest interocular distance at the clypeus. It is evident that in this way the males of the three specimens are rather clearly separated.

Unfortunately we have failed to discover constant and reliable differences between the females of *Sc. assimile* and *Sc. asiaticum*. Both are easily distinguished from the North American *Sc. caementarium* by the pronounced reduction of the yellow colour on the hind tibiae. Moreover we have found that in Central America, where *Sc. assimile* and *caementarium* may occur together, the yellow spots at the base of the propodeum, regularly present in the former, are absent in the latter. It is possible, however, that this difference will prove to be less reliable than it seems to be on the basis of the limited material now available to us.

In the females of *Sc. assimile* the hind tibiae usually have a yellow stripe of variable length on the inner (under) side, whereas specimens with entirely black tibiae are not rare in samples of *Sc. asiaticum*; yet as far south as Argentina one may find specimens which agree in this respect with *Sc. assimile.*

Concerning the three remaining American species (Fig. 14 and 18) we may remark that they form a rather heterogeneous group. *Sc. argentifrons* and *fasciatum*, hitherto not separated, are closely related inhabitants of some of the West Indian islands. They differ from the other American species in numerous characters, which suggests that they have become isolated rather long ago. *Sc. jamaicense*, on the other hand, resembles *Sc. caementarium* very closely, particularly in the shape of the clypeus and the genitalia of the male, and is likely to have originated at a later date.

Sceliphron (Sceliphron) caementarium (Drury)

?"Guêpe ichneumon & maçonne", Réaumur, 1742, Mém. Hist. Ins. 6: 278, 279, Pl. 28 F. 4, 5 — "Saint Domingue".

Sphex caementaria Drury, 1773, Illustr. Nat. Hist. 2, Index for vol. 1; description in vol. 1 (1770): 105, F. 6—8, Pl. 45 F. 8—10 (nest) — "Antigua, St. Christopher's and Jamaica" (types lost).

Sphex flavo-maculata DeGeer, 1773, Mém. serv. Hist. Ins. 3: 588, Pl. 30 F. 4 — "Pensylvanie", leg. Acrelius (NRS).

Sphex lunata Fabricius, 1775, Syst. Entom.: 347 — "Antigua", leg. Drury (lectotype in coll. Fabricius, UZMC).

Sphex flavipes Fabricius, 1781, Spec. Insect. 1: 444 — "America", leg. Blackburn (lectotype in coll. Fabricius, UZMC).

Sphex flavipunctata Christ, 1791, Naturg. d. Insekt.: 301, Pl. 30 F. 1, ♀ — "Antigua, St. Christoph und Jamaika" (new name for *Sphex caementaria* Drury).

Sphex affinis Fabricius, 1793, Entom. Syst. 2: 203 — "in Americae Insulis", leg. von Rohr (syntypes in coll. Fabricius, UZMC).

Pelopoeus architectus (Klug) Lepeletier, 1845, Hist. Nat. Ins. Hym. 3: 313, ♀ — "New Orleans", coll. Spinola (?MT) [omitted by Kohl, 1918].

Pelopoeus servillei Lepeletier, 1845, Hist. Nat. Ins. Hym. 3: 313, ♀ — "Sans patrie", coll. Serville (MT).

Pelopoeus solieri Lepeletier, 1845, Hist. Nat. Ins. Hym. 3: 318, ♀ — "Guadeloupe", coll. Serville (MT).

Pelopoeus canadensis Smith, 1856, Cat. Hym. Brit. Mus. 4: 233, ♂ — "Canada" (BM, type no. 21.617).

Pelopoeus nigriventris Costa, 1864, Ann. Mus. Zool. Napoli 2 (1862): 60 — North America (Mus. Naples).

Pelopoeus tahitensis Saussure, 1867, Reise "Novara", Zool. 2, Hym.: 27, ♀ ♂, Pl. 2 F. 17 — "Otahiti" (MNHG).

Sceliphron (*Pelopoeus*) *caementarium*; Kohl, 1918, Annln naturh. Mus. Wien 32: 115.

Sceliphron caementarium; Porter, 1926, Proc. U.S. nation. Mus. 70: 5; Krombein, 1949, Proc. Hawaii. ent. Soc. 13: 388 (Marshall Is. and Mariana Is.); Bohart and Menke, 1963, Univ. of Calif. Publ. Ent. 30: 116.

Sceliphron caementarium is remarkable for having spread, more or less recently, far beyond the limits of its original range. The colonizing capacity is even more pronounced here than in *Sc. madraspatanum*. The originally North American species has not only become established in many islands in the Pacific, in the West Indies and in Madeira (here at least since 1825), but in recent years it appears also to have gained a foothold in Peru and in Japan. It will be interesting to see how the species will behave in these new habitats.

The abundance of names applied to this species is partly due to the rather variable colour pattern. Initially almost every specimen not agreeing perfectly with an existing description was described as a new species. H. de Saussure (1867) was the first to recognize the variability of such characters as pubescence, coloration, and size. He wrote: "Die Auctoren haben deswegen eine Menge Arten aufgestellt, welche aber nur verschiedene vom Klima erzeugte Modificationen weniger Formen darstellen." He accepted *Sc. servillei* with some doubt as a separate species and enumerated five varieties or "species nascentes" as forms of *Sc. caementarium*.

Kohl (1918) arranged the eight colour varieties known to him in a key which clearly demonstrates that the variation is correlated with the distribution to a very limited extent only.

Bohart and Menke (1963) discuss the variation in colour pattern in rather general terms and do not use the existing names. They point out that specimens from Canada and the northern United States show a great reduction in the amount of yellow, and that southward the yellow markings increase in size. They suggest that "this clinal variation is probably explained by climatic factors".

Evidently it is neither possible nor desirable to describe the variation of this species on the American continent in terms of subspecies. Yet it seems useful to describe the colour pattern of certain more or less homogeneous populations, particularly of those units which have recently become established outside of the original range. It is evident that these immigrants are now often living under ecological conditions which are much different from those prevailing in their country of origin, and that their colour patterns may not be in accordance with the correlations observed on the American mainland. Perhaps a detailed study of the colour patterns might tell us something about the origin of these immigrants; furthermore it would be of interest to determine whether the patterns of the insular isolates are likely to change within relatively short periods under the influence of different selection pressures.

For this purpose it would be useful to describe the colour patterns in a concise way, and this might perhaps be done as follows:

Thorax:	only the tegulae yellow	0
	markings more or less reduced	1
	markings complete (pronotum, mesepisternum, scutellum, postscutellum)	2
Propodeum:	black	0
	declivity ± yellow	1
	basal spots and declivity yellow	2
	also dorsum partly yellow	3
Gastral petiole:	black	0
	partly yellow	1
	entirely yellow	2
First gastral tergite:	black	0
	spots or narrow apical band	1
	wide apical band (at least half the length) to entirely yellow	2

On this basis the pattern of the colour forms distinguished by Kohl (A—H) and other authors may be described as follows:

Var. A = *flavipes*	0	0	0	0
Var. B	0	0	0	1
Var. C	1	0	0	0
Var. D	1	0	0	1
Var. E = *affine* = *nigriventre*	1—2	0	0	0
Var. F = *caementarium* = *flavomaculatum* = *lunatum* = *architectum* (2.1.0.0.) = *solieri* = *canadense* (♂) = *tahitense*	2	1	0	1—2
Var. G	2	2—3	0—1	2
Var. H = *servillei*	2	2—3	2	2

Northern America: see Bohart and Menke, 1963: 115, 117, Fig. 8; also Pilon and Steiner, 1966: 484 and Fig. 2.

Key West: 1 ♀ June 1925, H. Boschma (ML).

Bermuda Is.: 1 ♀ Bermuda, Owen Bryant, 1 ♂ do., W. S. Brooks (MCZ). 1 ♂ Aug.-Sept. 1928, H. Boschma (ML); 2 ♀ 1 ♂ Bermuda, July 1925 (BM, 1925-351).

Mexico: "Mexico", 1 ♀ Sommer, 1 ♀ 1 ♂ Sallé, 1 ♀ Boucard (NRS).

Puerto Rico: 1 ♀ Mayaguez, coll. E. Vázquez (MCZ), 1 ♀ Adjuntas, 16 Febr. 1965, coll. Mendez (MCZ); 1 ♂ Ponce, 1935, coll. L. Rivara (Puvera?) (MCZ).

Lesser Antilles: St. Thomas, 1 ♀ "*P. lunatus* F.", coll. Westermann (UZMC), 4 ♀ leg. Eggers (UZMC, 1 ♀ ML), 1 ♂ coll. Hauschild (UZMC; thorax with extensive yellow markings, propodeum with basal spots, posterior mark with "horns" on dorsal area, petiole black, tergite 1 almost entirely yellow; index of pattern = 2302), 2 ♀ leg. Orsted (UZMC). — St. Croix, 1 ♀ coll. Hauschild (UZMC, tergite 1 almost black). — Montserrat, 2 ♀ Montserrat, 8 Sept., Pomerat coll. (MCZ), 1 ♀ Bot. Garden, 1931, C. A. Gomez, 1 ♀ 11 Febr. 1931, Lt. A. D. Torlesse (BM); 1 ♂ Belham River, 14 June 1965, 6 ♀ 7 ♂ Plymouth, 14—15 June 1965, D. C. Geijskes and Mrs. E. Geijskes (ML; in all specimens gastral petiole entirely black; propodeum without basal spots, except in one ♂ which has small spots). — Guadeloupe, 1 ♀ 2 ♂ Pointe-A Pitre, 7 June 1965,

D. C. Geijskes (ML). — Martinique, 6 ♀ (old specimens) "Martinique" (MCZ); 1 ♂ do., Ruins of St. Pierre, Virginia Exp. (MCZ), 1 ♀ 30 Sept. 1925, L. E. Cheesman (BM). — St. Vincent, 1 ♂ (BM). — Grenadines, 11 ♀ Moustique I., H. H. Smith (BM).

Peru: 3 ♀ 1 ♂ Sullana (4.52 S., 80.39 W.), Hda. Mallares, May 1954 (1 ♀), Aug. 1954 (1 ♂) and May 1955 (2 ♀), W. Markl (NMB; 1 ♀ ML). — Evidently a recent introduction.

Madeira: 4 ♀ Madeira, leg. Wollaston (BM); 1 ♀ Madeira, 1825, coll. Hauschild, 1 ♂ do., Rathke, coll. Sehestedt — T. Lund (UZMC); Madère, env. de Funchal, 1936, L. Chopard (MP).

Japan: According to information received from Prof. Iwata in 1960 this species was accidentally introduced into Japan after the second world war; he said that it has become established there near the cities of Tokyo, Yokohama, and Osaka; recently, Prof. K. Tsuneki wrote us that it occurs throughout the flat land of Kanto Province, but that Osaka may be an incorrect record. Its life history in Japan was studied by Dr. Toshitomo Shida, 1952 (Shin Konchû 5, no. 3).

Hawaiian Is.: in a series from these islands (BM) the yellow markings show a tendency to disappear.

Wallis Is.: 3 ♀ 12 Nov. 1958, J. Rageau (BM, 1958-713).

Samoa: 1 ♂ W. Samoa, Aitutaki, March 1958 (LAM; propodeum with reduced yellow mark at apex; petiole black, tergite 1 with yellow band).

Society Is.: 1 ♀ Raiatea, 26 May 1925, 1 ♀ Bora bora, L. E. Cheesman (BM); Tahiti, 6 March 1925, L. E. Cheesman (BM); 1 ♀ 1 ♂ Tahiti, Papeari, April 1926, coll. G. Olrik (UZMC); series Papeete (MP).

Marquesas Is.: 2 ♀ Hiva-Oa, series Futa-Hiva and Nuku-Hiva, 1925, L. E. Cheesman (BM); series "Nukuhiva" (MP).

Gambier Is.: series from Mangareva, Rikitea, 1905, G. Seurat (MP).

New Caledonia: 7 ♀ 2 ♂ Anse Vata, Jan.-Febr. 1957, J. Rageau (BM); series Nouméa (MP).

Additional localities where the species has been introduced more or less recently: Marshall Islands, Marianas, and Fiji (Bohart & Menke, 1963: 117), and the area around Brisbane (in lit. Dr. E. F. Riek, Dec. 1956).

Sceliphron (Sceliphron) assimile (Dahlbom)

Pelopoeus assimilis Dahlbom, 1843, Hym. Europ. 1: 23, ♂ ♀ — "Cuba", leg. Lefebvre (Mus. Lund).

Pelopoeus cementarius [!]; Cresson, 1865, Proc. ent. Soc. Philad. 4: 134 (Cuba).

Sceliphron caementarium var. *nicaraguanum* Kohl, 1918, Annln naturh. Mus. Wien 32: 118 — "Nicaragua" (ZMB).

Sceliphron assimile; Porter, 1926, Proc. U.S. nation. Mus. 70: 9; Bohart & Menke, 1963, Univ. of Calif. Publ. Ent. 30: 115, F. 8, 61.

Porter's identification of this species was based on notes made by H. T. Fernald, who studied the types in 1913. According to Porter the range of *Sc. assimile* includes "the extreme southern part of Texas, Mexico, Central America, the West Indies, and the northern part of South America". This is partly incorrect: there are no reliable records from South America, and the species inhabits only part of the West Indies. Bohart and Menke have recorded this species from Texas, Central America (Mexico-Panama) and Cuba. The occurrence in Panama appears to need confirmation; on the other hand there is no doubt that Jamaica, Puerto Rico, and some of the Lesser Antilles are included in the range.

It would be interesting to make a detailed study of the relations between *Sc. caementarium* and *assimile* in the zone of overlap of these species. The southern limit of the range of *Sc. caementarium* in Mexico is not well known. Whereas two females from Jalisco in the British Museum are certainly *assimile*, we noted with interest that a female from this province in the same collection has a clear yellow ring at the base of the hind tibiae. Unfortunately this character is not reliable enough to state with certainty that this specimen is a true *caementarium*. It is desirable to pay special attention to the collecting of males in the areas where both species might occur.

Texas: 8 ♀ "Tex., no. 1576" = Brownsville, 20 July 1895, F. B. Armstrong (*figulus* det. B. A. Porter) (USNM); 1 ♀ Brownsville, 30 April 1895, C. H. T. Townsend, 1 ♂ do., without date (USNM), 1 ♂ Mission, 7 Febr. 1940, Phil Rau, no. 2384 (1 ♂ with similar label no. 2407?) (USNM); 1 ♀ Ft. Ringgold, 18 May 1895 (USNM).

Mexico: 1 ♀ 2 ♂ "Mexico", Sallé, 1 ♂ Lovén (NRS); 2 ♀ 1 ♂ "Mex", coll. Saunders (OUM); 1 ♀ Presidio, Forrer, coll. Cameron (BM); 2 ♀ Santiago Iscuintla, Jalisco, July, Schumann (BM); 1 ♂ Navarrete, Tepic, Schumann (BM); 1 ♀ 1 ♂ Colima, L. Conradt (USNM); 1 ♀ 1 ♂ Acapulco, 3 May 1952, Galathea Exp. 1950—'52 (UZMC); series of ♀♀ and 1 ♂ from N. Yucatan, leg. Gaumer (BM).

British Honduras: 2 ♀ Br. Honduras (BM); 1 ♂ Br. Honduras, R. Sarstoon Blancaneau (ML).

Costa Rica: 1 ♀ 1 ♂ San Lucas, July 1934, C. H. Ballou (USNM); 1 ♀ Bebedero, las Cañas, June-July 1930, Reimoser (NMW; first gastral tergite nearly black); 1 ♀ San José, Aug. 1930, Tristan (ML); 2 ♀ San José, March 1932, Schmidt (ZMB); 1 ♂ San Juan, July 1930, Tristan (NMW).

Cuba: 1 ♀ 1 ♂ "Cuba, D. Lefebvre", types (Mus. Lund); 3 ♀ 3 ♂ "Cuba, Guérin, ex coll. Monchicourt" (ML); 1 ♀ Havana, leg. Baker (BM, ex coll. Cameron, 1903-297); 1 ♀ Las Animas, Pinar del Rio, 1500 ft., 3—5 Sept. 1934, S. C. Bruner and A. R. Otero (MCZ); 1 ♀ 1 ♂ Santiago de las Vegas, Habana, 1 Nov. 1934 and 14 Sept. 1930, S. C. Bruner (MCZ). Santa Clara, 14 ♀ 4 ♂ San Blas, Trinidad Mts., Aug. 1932, B. B. Leavitt (MCZ, 1 ♀ 1 ♂ ML); 1 ♀ Buenos Aires, 8 Aug. 1932, B. B. Leavitt (MCZ); 1 ♀ Buenos Aires, Trinidad Mts., 17—23 June 1939, C. T. Parsons (MCZ); 1 ♀ Mina Carlota, Trinidad Mts., 11—16 July 1939, C. T. Parsons (MCZ). 4 ♀ 1 ♂ Soledad, Cienfuegos, Aug.-Sept. 1930, Richard Dow (MCZ); 3 ♂ Castillo de Jagua, Cienfuegos, 5 Sept. 1930, R. Dow (MCZ); 1 ♀ 2 ♂ Baragua, Camaguey, June-July 1932, Bates and Fairchild (MCZ); 1 ♀ do., July, U. C. Loftin (MCZ); 1 ♂ Jobabo, Jan., C. F. Stahl (MCZ).

Jamaica: 1 ♀ "Jamaica" (NRS); East Jamaica, 2 ♂ Golden Grove, 7 July 1962, 1 ♂ Duckenfield, 12 July 1962, G. F. Mees (ML); 2 ♀ "Jamaica, W. I.", coll. W. Schaus (USNM).

Puerto Rico: 2 ♀ 3 ♂ Mayaques, 9 Aug. 1963, P. H. van Doesburg Jr. (ML); 1 ♂ San Juan, 1—3 Febr. 1967, H. E. Evans (MCZ).

Lesser Antilles: St. Martin, 1 ♀ Rijgersma (ML). — St. Kitts, 6 ♀ 4 ♂ Basse Terre, May-June, C. Roys (MCZ); 2 ♂ Wingfield Est., 15 July 1960, Imp. College Exp. (BM). — Montserrat: 3 ♀ 6 ♂ 31 March 1894, 1 ♀ 3 ♂ "Iss." [issued] 9 May 1894 (one ♂ with label "Gen. IV"), 2 ♂ "Iss." 19 May 1894 (one ♂ with label "Gen. I", 2 ♀ 5 ♂ "Iss". 1 June 1894, 1 ♂ "Iss." 2 July 1894, 1 ♀ "Iss." 16 July 1894, C. V. Riley (USNM, no. 6204); it is of interest to note that the series "no. 6204, Montserrat, C. V. Riley" also contains a ♀ of *Sc. caementarium* (basal half of hind tibiae yellow; basal spots of propodeum lacking, but present in all specimens recorded above), collected 18 March 1894. — ?St. Lucia, 2 ♀ Vigil Beach, 16 May 1965, 1 ♀ Blue Water Beach Hotel, 20 May 1965, D. C. Geijskes (ML); the identification remains somewhat uncertain so long as no males have been collected in this island.

Sceliphron (Sceliphron) asiaticum asiaticum (Linné)

Sphex asiatica Linné, 1758, Syst. Nat., 10th ed.: 569 — "in Indiis"; 1764, Mus. Ludov. Ulric.: 405 ("Asia").

Pelopoeus figulus Dahlbom, 1843—5, Hym. Eur. 1: 23, 434, ♀ — "e Gallia meridionali", leg. Westermann (1843: 23), "America" (1845: 434).

Pelopoeus vindex Lepeletier, 1845, Hist. Nat. Ins. Hym. 3: 317, ♂ — "Cayenne", coll. Serville (MT).

Pelopoeus bimaculatus Lepeletier, 1845, Hist. Nat. Ins. Hym. 3: 319, ♀ — "Cayenne", coll. Serville (?MT).

Sceliphron (*Pelopoeus*) *figulus*; Kohl, 1918, Annln naturh. Mus. Wien 32: 119.

Sceliphron figulum; Porter, 1926, Proc. U. S. nation. Mus. 70: 11.

Sceliphron asiaticum; van der Vecht, 1959, Ent. Ber., Amst. 19: 129, 132.

Pelopoeus bimaculatus Lep. was regarded by Kohl (1918) as identical with *Sc. fistularium* (Dahlb.), but we agree with Porter (1926) that it belongs in the synonymy of *Sc. asiaticum.* The specimens recorded by Kohl from Mexico, Guatemala, and Nicaragua, almost certainly belong to *Sc. assimile.*

For a discussion of the characters of this species we may refer to the key and to pp. 217—222. The yellow markings of the propodeum are variable, as noted by Kohl (l.c.: 120); in specimens from northern localities the dorsum is often more extensively marked with yellow than in those from the central and southern parts of the range.

Panama: 2 ♀ 2 ♂ Panama, Boucard (BM); 1 ♀ 1 ♂ Ancon, C.Z., 28 April 1922, J. Zetek and F. Molino (USNM).

Colombia: series prov. Magdalena and Sevilla (BM); 1 ♂ Cali (ZMB); 1 ♀ Cali, July-Sept. 1959, J. G. Betrem, 1 ♀ Valle del Cauca, Palmira, 10 April 1959, E. Sanguino (ML).

Venezuela: 1 ♀ Merida (UZMC); 6 ♀ 2 ♂ Caracas, leg. Styrup, coll. Drewsen (UZMC); 2 ♀ Caracas, van Lansberge (ML); 5 ♀ Acosta, Falcon, leg. Kugler (NMB; 2 ♀ ML); 1 ♀ Maracay, La Trinidad, 1—14 July 1934, C. Vogl (ZMB).

Curaçao: 2 ♂ "Curaçao", leg. Father Jansen (ML); 1 ♀ Parera, 9 Febr. 1939, H. W. Cossee (ML); 1 ♀ 1 ♂ Caribbean Marine Biol. Inst., Oct.-Nov. 1956, R. H. Cobben (ML); 1 ♀ St. Barbara, 5 Sept. 1963, D. C. Geijskes (ML).

Aruba: 1 ♀ 10 May 1955, P. Wagenaar Hummelinck (ML); 2 ♀ April 1957, R. H. Cobben (ML).

Trinidad: 6 ♀ 3 ♂ Trinidad, E. B. Connell, 1914-383 (BM).

British Guyana: Richards (1937) does not mention this species; according to Bodkin (1918, Trans. R. ent. Soc. 1917: 315) it is less numerous in British Guiana than *Sc. fistularium.*

Suriname: series from the coastal area: Tibiti Savanne, Coronie, Groningen, Paramaribo and environs, Marienburg, Afobaka, Galibi, throughout the year, several collectors (ML); 1 ♀ 1 ♂ Upper Corantine River, Coeroeni Air Strip, 18—22 June 1963, J. G. Wessels Boer (ML).

Brazil: 2 ♀ "Brasilia", Esterro (MBUD); 3 ♀ 1 ♂ "Brasilia", coll. Drewsen, "*bimaculatus* Lep." (UZMC); 1 ♀ "Brasil", leg. Calkoen (ML); 2 ♀ "Brasil", from Mus. Berlin (ML); series Pará (BM); 1 ♀ 1 ♂ Ceará, 1931, Dias de la Roche (USNM); 1 ♀ Amazon, Rio Autaz, leg. Roman (NRS); 1 ♀ Santa Catarina, Nova Teutonia, Dec. 1954, P. Flaumann (ML); 1 ♀ do., without date (NRS); 1 ♀ Santa Catarina, Neu Bremen, Rio Laeiss, 5 Febr. 1933, Fr. Hoffmann (ZMB); 1 ♀ Rio Grande do Sul (ML); 1 ♀ do., San Leopoldo, J. W. Stahl (NRS); 4 ♀ 1 ♂ do., Pelotas, 10 Dec. 1947, M. de Biezanko (NMW).

Bolivia: 1 ♂ 1 ♀ Villa Montes, Oct. 1930 and Jan. 1931, resp., Eisentraut (ZMB); 1 ♀ "Bol. Chac."(?), Erland Nordenskjöld (NRS).

Paraguay: Sapucay, W. Forster (BM, 1905-188); 1 ♀ 1 ♂ Chaco, Nanawa, in copula (BM); 1 ♀ La Zanja (?La Zauja), W. Sörensen (UZMC); 7 ♀ Colon. Risso, coll. Dr. Ternez (NMB, 1 ♀ ML).

Uruguay: 3 ♀ 2 ♂ "Uruguay", leg. Boucard (NRS); 1 ♀ do., from Meyer-Dür (ML); 1 ♀ Montevideo, Galathea Exp. (UZMC); 1 ♀ do., Kröyer (UZMC).

Argentina: Formosa, 1 ♂ Gran Guardia, Jan. 1953 (ML). — Misiones Terr., 1 ♀ Posadas, 13—15 Febr. 1927, F. & M. Edwards (BM). — N. Argentina, 1 ♂ Chaco de Santiago, leg. Wagner (NRS); 3 ♀ Tucuman, coll. Wüstnei (UZMC). — La Rioja, series Patquia (BM). — Santa Fé, Rio San Javier, G. E. Bryant (BM, 1912-268). — Cordoba, 1 ♀ leg. Dohrn (ML). — Mendoza, 1 ♂ Mendoza, March 1946, coll. Mauzoner (ML), 3 ♀ do., 13 March 1908, P. Jörgensen (UZMC), 1 ♂ do., 8 April 1908, Jensen-Haarup (UZMC), 4 ♀ 7 ♂ Est. Pedregal, Jensen-Haarup (UZMC, 2 ♀ 2 ♂ ML); 2 ♀ 5 ♂ Chacras de Coria, Febr.-April 1907 and Jan.-Febr. 1908, P. Jörgensen (UZMC), series San Rafael (MP), 1 ♀ Potrerillos, 6 Jan. 1927, F. & M. Edwards (BM). — Buenos Aires, 2 ♀ delta of Paraná near Buenos Aires, Febr. 1929, Lt. C. Morley Knight (BM, ML); 1 ♀ 1 ♂ Rio de la Plata, coll. Schiödte, 1 ♀ 1 ♂ do., coll. Westermann, 1 ♂ do., coll. Drewsen (UZMC).

Sceliphron asiaticum chilense (Spinola)

Pelopoeus chilensis Spinola, 1851, in Gay, Hist. fis. Chile, Zool. 6: 395, ♂ ♀ — Chile (?MT).
Sceliphron (*Pelopoeus*) *figulus* var. *chilense*; Kohl, 1918, Annln naturh. Mus. Wien 32: 48, 120.

Chile: 2 ♀ "Chile" (BM 86-28); 1 ♀ 1 ♂ "Chile", Reed (OUM); 2 ♀ 1 ♂ "Chile", Dr. E. P. Reed (BM); 1 ♂ "Chili", coll. Drewsen (UZMC); 1 ♀ Valparaiso, Dr. F. Reed (ML); 1 ♀ do., Galatea (UZMC); 1 ♀ 1 ♂ Santiago, 1923, Father Claude-Joseph (USNM); 1 ♂ do., 27 Dec. 1923, A. Faz (ML); 1 ♀ Rancagua, Dec. 1904, P. Herbst (MBUD); 3 ♀ 1 ♂ Cauquénes, Febr. 1899, Schoenemann (ZMB).

Argentina: 1 ♀ Mendoza, March 1946, coll. Manzoner (ML); 1 ♀ prov. Neuquen, Junin de los Andes, 19 Jan. 1955, "on mud nest below window-sill", J. B. Ricketts (BM).

Sceliphron (Sceliphron) fasciatum (Lepeletier)

Pelopoeus fasciatus Lepeletier, 1845, Hist. Nat. Ins. Hym. 3: 315, ♀ — "Sans patrie", coll. Serville (MT).

Sceliphron fasciatum; ?Ashmead, 1900, Trans. R. ent. Soc. Lond. 1900: 229 (St. Vincent, 6 ♀ 4 ♂); Schulz, 1903, Sber. bayer. Akad. Wiss. 1903: 470, Pl. Fig. 4 (Haiti) [overlooked by Kohl, 1918].

Sceliphron (*Pelopoeus*) *argentifrons*; Kohl, 1918, Annln naturh. Mus. Wien 32: 112 [pro parte].

Sceliphron fasciatum; Porter, 1926, Proc. U. S. nation. Mus. 70: 16 ("Isle of Pines, Haiti and Cuba") [pro parte!].

Both Kohl (1918) and Porter (1926) failed to discover that the Antillean islands are inhabited by two very similar black-legged species of *Sceliphron*. Kohl recorded them together under the name *argentifrons*, and deliberately avoided the use of Lepeletier's older name *fasciatum*, because his specimens did not agree in all respects with this author's description. Both Ashmead and Porter treated *argentifrons* as a synonym of *fasciatum*, apparently without having seen the type of the latter species.

After we had found that two species are involved, it became particularly important to determine the identity of *Pelopoeus fasciatus* Lepeletier. The type is preserved in the Spinola collection of the "Istituto e Museo di Zoologià dell' Universita" at Turin. Fortunately, upon our request, one of the scientists of this Institute, Dr. U. Parenti, kindly compared this specimen with some sketches and notes indicating the differences between the two species. He was thus able to ascertain that *Sc. fasciatum* and *Sc. argentifrons* are not identical.

Hispaniola: Dominican Republic, 6 ♀ 4 ♂ Haina and La Romana, pres. by Imp. Inst. Ent. (BM, 1930-336; 1 ♀ 1 ♂ ML); 1 ♀ "S. Domingo", received about 1840 from Mus. Berlin (ML); 1 ♀ "S. Domingo" (NMW). — Haiti, 1 ♀ Mt. Rouis, 14 Aug. 1934, M. Bates (MCZ); 4 ♀ swamps of Dessalines, 11 Sept. 1934, M. Bates (MCZ; 1 ♀ ML); 2 ♀ Port au Prince & vic., 3 Oct. 1934, Darlington (MCZ).

Guadeloupe: 2 ♀ leg. Gourbeyre, June-July 1952, L. Berland (MP; "*argentifrons* det. Berland").

St. Vincent: apparently the species has not been collected here since it was recorded by Ashmead (1900). This record was almost certainly incorrect; see p. 254.

Two females from "Cuba" (NMW), both with illegible collector's label (?"Aithr"), are almost certainly incorrectly labelled.

Sceliphron (Sceliphron) argentifrons (Cresson)

Pelopoeus argentifrons Cresson, 1865, Proc. ent. Soc. Philadelphia 4: 136 — "Cuba" (1 ♀ coll. Ent. Soc. Philad.).

Sceliphron argentifrons; Kohl, 1918, Annln naturh. Mus. Wien 32: 112, ♀ ♂ [pro parte!].

Sceliphron fasciatum; Porter, 1926, Proc. U. S. nation. Mus. 70: 16 (syn.: *Sc. argentifrons* Cresson) [pro parte!].

The characters distinguishing this species from the similar inhabitant of the islands of Hispaniola and Guadeloupe are enumerated in the key. The distribution and ethology of both these species deserve further study.

Cuba: 3 ♀ "Havane, '64", leg. Poey, coll. Sichel (MP); 1 ♀ 1 ♂ Guantanamo, H. Rolle (NMW); 1 ♀ "Cuba, Richt", G. Mayr, 1870 (NMW); 1 ♀ "Cuba, Wthm" (NMW); 3 ♀ "Cuba", Ch. Wright (MCZ, 1 ♀ ML); 1 ♀ Isla de Pinos, 5 June 1913, R. Oertel (MCZ); 2 ♀ Vilches Potrero, Soledad, Cienfuegos, 19 Aug. 1930, Richard Dow (MCZ).

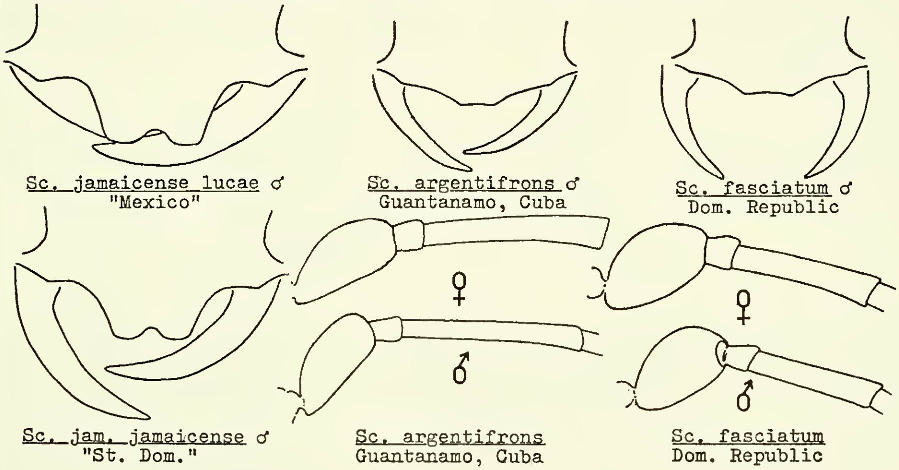


Fig. 18. Central American species: anterior part of clypeus, with mandibles, and antennal segments 1—3

Sceliphron (Sceliphron) jamaicense jamaicense (Fabricius)

Sphex jamaicensis Fabricius, 1775, Syst. Entom.: 347 — "Jamaica" (type lost?).

Sphex iamaicensis [!]; Fabricius, 1781, Spec. Insect. 1: 444.

Pelopoeus annulatus (Klug MSS.) Cresson, 1865, Proc. ent. Soc. Philadelphia 4: 135, ♀ ♂ — "Cuba" (types, 1 ♀ 2 ♂, coll. Ent. Soc. Philadelphia).

Sceliphron (*Pelopoeus*) *jamaicense*; Kohl, 1918, Annln naturh. Mus. Wien 32: 114 (Cuba; Jamaica; Haiti).

Sceliphron jamaicensis; Porter, 1926, Proc. U. S. nation. Mus. 70: 5, 17 (Haiti; Bahamas; Cuba; Jamaica).

Sceliphron jamaicense; Krombein, 1953, Am. Mus. Novit. 1633: 17 (5 ♀ Bimini, South Bahamas).

Cuba: 12 ♀ 4 ♂ Guantanamo, from H. Rolle (NMW; 1 ♀ 1 ♂ ML); 1 ♀ from unknown locality, from Monchicourt, is perhaps from Cuba (ML); 1 ♀ Guaro Oriente (MCZ); 1 ♀ Preston Oriente, Corua (MCZ); 1 ♀ Jobabo, "I-21-25, TPRF, Ent. no. 82", C. F. Stahl (MCZ); 1 ♀ "Cuba", Dohrn (NRS).

Jamaica: 2 ♀ Jamaica (BM, 47-62); 1 ♀ Jamaica (BM, 45-110).

Hispaniola: 1 ♀ "St. Dom." (BM, 55-1), 1 ♂ "St. Dom.", coll. Saunders (OUM); 1 ♀ S. Domingo, S. Henshaw, acc. no. 3668 (MCZ); 1 ♀ San José de las Matas, Dom. Rep., 1000—2000 ft., June 1938, Darlington (MCZ).

Bahamas: 1 ♀ Simon's, Long Island, July; 1 ♀ Nassau, XI; 2 ♀ Nassau, New Providence, 28 June 1904, Allen, Barbour and Bryant; 1 ♀ 1 ♂ Cat Island, Arthurs Town, July-Aug. 1935, W. J. Clench (all MCZ).

Sceliphron (Sceliphron) jamaicense lucae (Saussure)

Pelopoeus lucae Saussure, 1867, Reise Novara, Zool. 2 (1): 30, ♀ ♂ — "California inferior; Promontorium St. Lucae" (? location of type).

Sceliphron lucae; Porter, 1926, Proc. U. S. nation. Mus. 70: 19 ("California; Lower California"); Bohart and Menke, 1963, Univ. of Calif. Publ. Ent. 30: 117 ("southern part of Baja California").

This form is so similar to typical *Sc. jamaicense* that we have decided to reduce it to subspecific status. The characteristic shape of the clypeus of the male is very similar in the two forms (Fig. 18), and a comparison of the male genitalia has shown that these agree in all details.

The gastral petiole varies from brownish yellow to dark brown.

Lower California: 2 ♀ "Basse Calif.", Diguet, 178-95 (MP); 2 ♀ 2 ♂ Cap St. Lucas, Sichel, with label "*dispar* Sichel" (MP).

Mexico: 3 ♀ 2 ♂ Etat de Jalisco, environs de Guadalajara, 1903, L. Diguet (MP).

B. GROUP OF Sceliphron spirifex (L.)

Male genitalia: Fig. 20—22, 25 and 26; pubescence of parameres short in *arabs* and *hemipterum*, with a varying number of long hairs in the other species; the row of teeth on the distal part of the aedeagus most distinct in *arabs* and *fistularium*, more or less reduced in the other species; apex of aedeagus truncate in *hemipterum* and *destillatorium*, roundly truncate in *fistularium*, and produced into a lateral tooth in the other species, in *spirifex* with a distinct tubercle just below the tooth; volsellar lamina on inner side produced into a bluntly rounded tooth in *spirifex*, *javanum*, and *laetum*, not or only slightly projecting there in the other species; pubescence of cuspis usually short, partly moderately long in *arabs*, and very long and dense in *spirifex* and *javanum*; volsellar digitus with short pubescence, its shape generally characteristic for the species, although subject to a certain degree of intra-specific variation (Fig. 25).

It is noteworthy that *Sc. arabs*, which in the female sex agrees with the *madraspatanum*-group in having a tooth on the inner side of the mandibles, also shows affinities with this group in the characters of the male genitalia (pubescence of parameres, teeth on aedeagus, shape of volsellar digitus).

Key to the species of the *spirifex*-group

1. Mandibles of ♀ simple, without tooth on inner side. Mesoscutum and scutellum normal 2

— Mandibles of ♀ with distinct tooth on inner side. Mesoscutum with three longitudinal furrows, the median furrow short and shallow, the lateral furrows deeper and

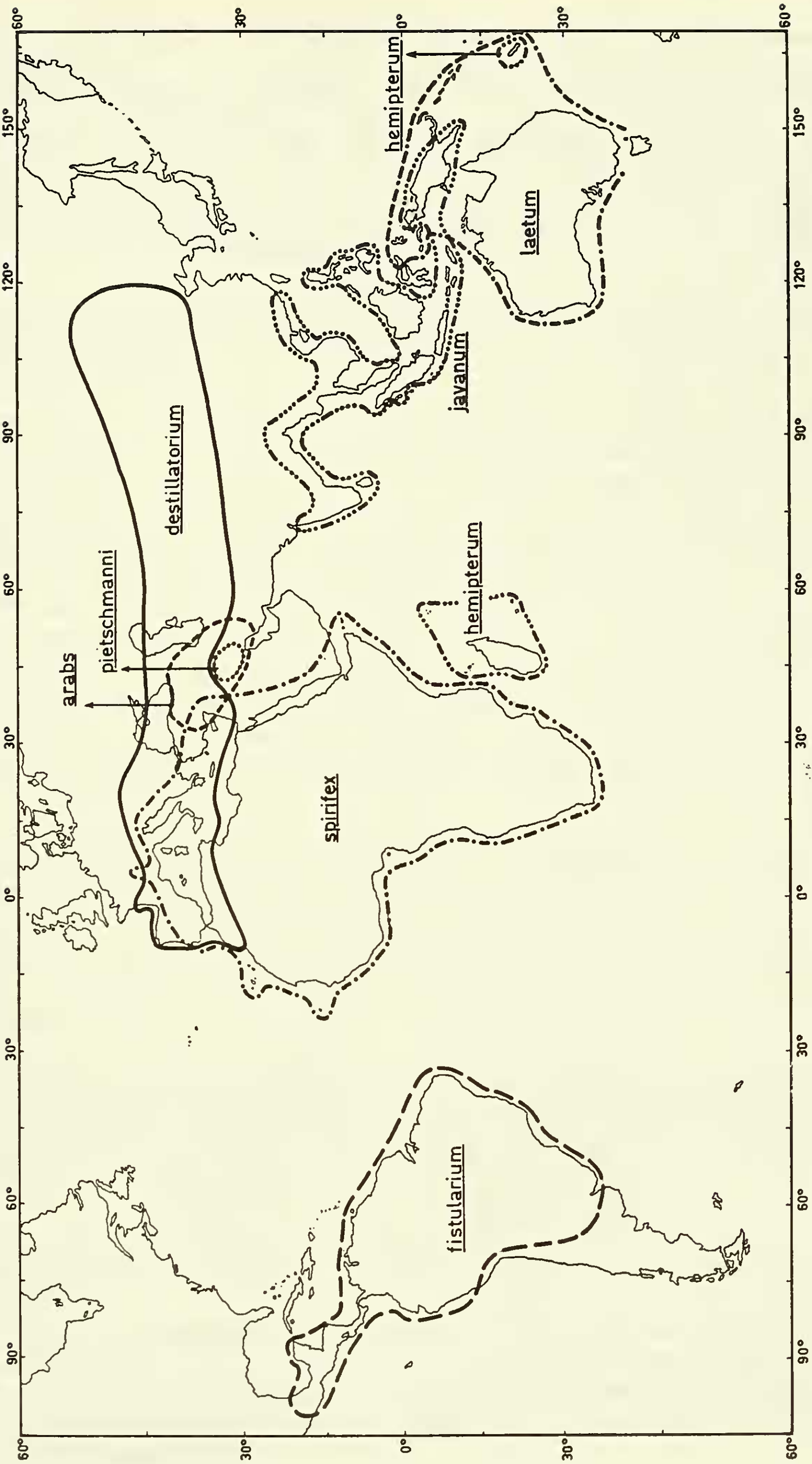


Fig. 19. Approximate distribution of the species of the *spirifex*-group

meeting posteriorly in front of the scutellum. Scutellum bituberculate; postscutellum convex, with weak median impression. — S.W. Asia . . . . *arabs* (Lepeletier)

2. Mesoscutum anteriorly transversely striate, posteriorly longitudinally striate, the striae fairly sharp, the interspaces not punctate. Second submarginal cell sometimes (?often) anteriorly slightly wider than the third (scutellum and postscutellum yellow). — S.W. Asia . . . . *pietschmanni* (Kohl)

— Mesoscutum more or less distinctly striate, but the striae not very sharply defined and the interspaces distinctly punctate. Second submarginal cell anteriorly as a rule narrower than the third 3

3. Thorax and legs without yellow markings. Sides of thorax partly dark brownish red. — Madagascar and neighbouring islands; New Caledonia. *hemipterum* (Fabricius)

— At least the legs marked with yellow 4

4. Tegulae and usually also the postscutellum marked with yellow 5

— Tegulae and postscutellum black. Gastral petiole as long as the hind tibiae, or a little shorter or longer 7

5. Gastral petiole relatively short, only about $4/5$—$5/6$ of the length of the hind tibia. Mesepisternum, propodeum, first gastral tergite and hind coxae black. Appressed pubescence (tomentum) of face silvery. Striation of sides of propodeum moderately coarse, the grooves between the ridges distinctly punctate. — Mediterranean through Asia to China . . . . *destillatorium* (Illiger)

— Gastral petiole about as long as the hind tibia or slightly longer. Mesepisternum with yellow or orange-yellow mark beneath the tegula; propodeum usually marked with yellow at apex; first gastral tergite and hind coxae marked with yellow. Face with golden tomentum. Striation of sides of propodeum coarser; the grooves between the ridges very finely longitudinally rugose, not punctate 6

6. Propodeum separated from the metapleura by a deep groove. First antennal segment yellow; the other segments black. Prothorax on each side with yellow spot. Propodeum on each side with three yellow spots: one laterally at base, one on the dorsal area, and one at apex. Gastral petiole thin, black with narrow yellow line on upper and under side. Hind legs black, with yellow spots on upper and under side of coxae and yellow line on outer side of femora. — South America . . . . *fistularium* (Dahlbom)

— Propodeum and metapleura separated by a distinct groove at apex only. Antennal segments 1 and 2 yellow, 3—6 or 3—7 yellow to ferruginous, more or less extensively brownish to blackish on outer side. Prothorax without lateral yellow spot. Propodeum with a single yellow mark at apex only (sometimes reduced or absent). Gastral petiole orange-yellow, sometimes more or less infuscated. Hind legs with at least the trochanters, the basal two thirds of the tibiae and the tarsal segments 1—4 yellow to ferruginous (metatarsus blackish at base); extent of yellow or ferruginous at base of hind femora variable. — Australia; New Guinea and neighbouring islands; Celebes . . . . *laetum* (Smith)

7. Basal part of hind tibiae and hind femora yellow, the apical part black (Fig. 23). — S. Europe; S.W. Asia; Africa . . . . *spirifex* (Linnaeus)

— Hind tibiae either entirely black or yellow to yellowish brown; hind femora variable (Fig. 23 and 27). — S.E. Asia; New Guinea, not in Celebes and Moluccas . . . . *javanum* (Lepeletier)

Sceliphron (Sceliphron) arabs (Lepeletier)

Pelopoeus arabs Lepeletier, 1845, Hist. Nat. Ins. Hym. 3: 309, ♂ — "Arabie", coll. Serville (MP!).

Pelopoeus caucasicus E. André, 1888, Spéc. Hym. Europe 3: 109, ♀, Pl. VII Fig. 3, 5, 9 — "Caucase" (coll. André).

Sceliphron (*Pelopoeus*) *caucasicum*; Kohl, 1918, Annln naturh. Mus. Wien 32: 90, ♀ ♂.

Sceliphron (*Pelopoeus*) *arabs*; Kohl, 1918, Annln naturh. Mus. Wien 32: 132 (unidentified species; "vielleicht eine Abänderung des *Sc. madraspatanum*").

This remarkable species is transitional between the groups of *madraspatanum* and *spirifex*, having a tooth on the inner side of the mandibles as well as angular hind coxae. As noted above, certain characters of the male genitalia confirm that this species occupies an intermediate position.

As the lectotype the senior author has selected a male in the Paris Museum; it bears an old label "Arabie", but this has evidently been misread by somebody who put a printed label "Mus. Paris, Grèce, Ile d'Eubée" on the pin and this may be the reason why the specimen has not been recognized as a type. According to information received from Prof. L. Pardi there is no typical material of this species in the Spinola collection in Turin. The specimen in Paris agrees well with the description; the pubescence of the head is rather dirty and this may explain why Lepeletier wrote "Caput... nigro pilosum". Kohl has suggested that *P. arabs* Lep. might be a variety of *Sc. madraspatanum*, but we do not know a form of this species with the colour pattern described by Lepeletier. In the British Museum this species was correctly identified as *arabs* Lepeletier.

Turkey: 3 ♂ Turkey (BM, 50-105); 1 ♂ Adana, from Rolle, Berlin (NMW); 1 ♂ Kozan, 26 June 1955, Erich Schmidt (coll. de Beaumont); 1 ♀ Diyarbekir, 2 July 1937, leg. Ramme (ZMB); 2 ♀ Diyarbekir, July 1937 (MBUD; ML); 1 ♂ Amanus "C. D. 1891", coll. de Gaulle (MP).

U. S. S. R.: Azerbaydzhan, 2 ♂ Yevlakh ("Jewlach, Transkaukasus"), 1886 (NMW).

Syria: 1 ♀ Nahr Kuwaik near Aleppo, 27 May 1952, Erich Schmidt (coll. de Beaumont); 3 ♀ Akbes, coll. de Gaulle (MP).

Iraq: 1 ♀ Baghdad, 1913, Mattanovich (MBUD); 2 ♀ Baghdad, May-July 1922, Maj. J. E. M. Boyd (BM).

Iran: 1 ♀ S.W. Persia, Escalera (BM, 1900-61); 1 ♀ Kut, May 1918, Maj. T. D. Broughton (BM); 1 ♀ Bushire (= Bushehr) (ETHZ); 8 ♀ Fez Charab, 31 July 1910, Mesopot. Expedition (NMW; 1 ♀ ML).

In the British Museum the senior author saw a specimen labelled "Tenasserim, Moulmein, Bingham coll.", and Kohl (1918) reports that the Mus. Berlin possesses specimens from this same collection which are said to come from Sikkim and Burma; we agree with him, however, that the occurrence in these areas needs confirmation.

Sceliphron (Sceliphron) pietschmanni Kohl

Sceliphron (*Pelopoeus*) *pietschmanni* Kohl, 1918, Annln naturh. Mus. Wien 32: 15, 91, ♀ — Hsitsche, Mesopotamia, leg. Pietschmann, 1910 (1 ♀, NMW!).

This species has the rich colour pattern of *Sc. arabs* (Lepeletier), but differs in having no tooth on the inner side of the mandibles; the postscutellum is marked with yellow.

Prof. de Beaumont kindly sent us a female specimen, collected at Abu Ghuraib in Iraq, 31 July 1944, by A. T. Meymarian; we noted that it is closely related to *Sc. spirifex,* but that it differs as follows.

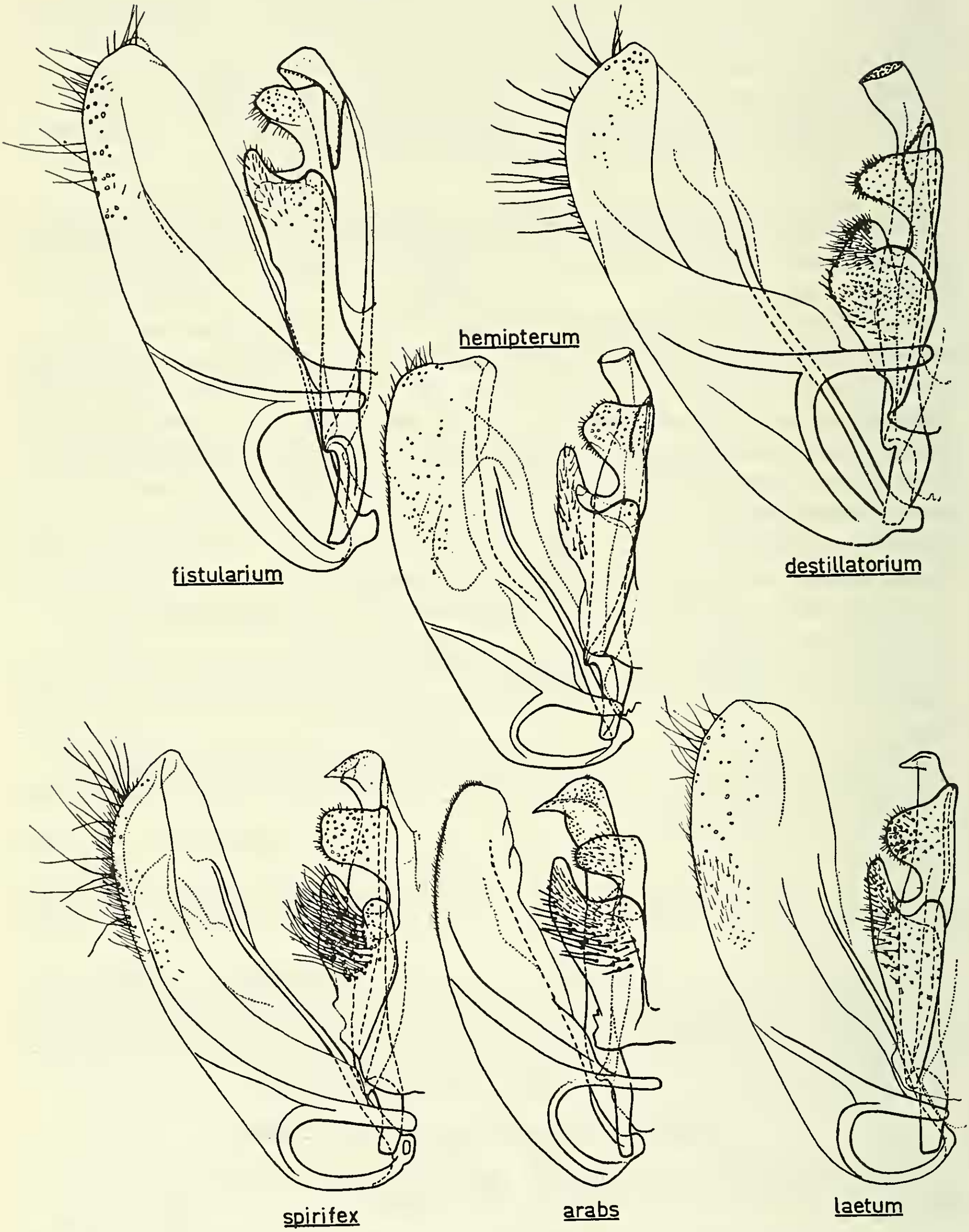


Fig. 20. Ventral view of male genitalia of species of the *spirifex*-group

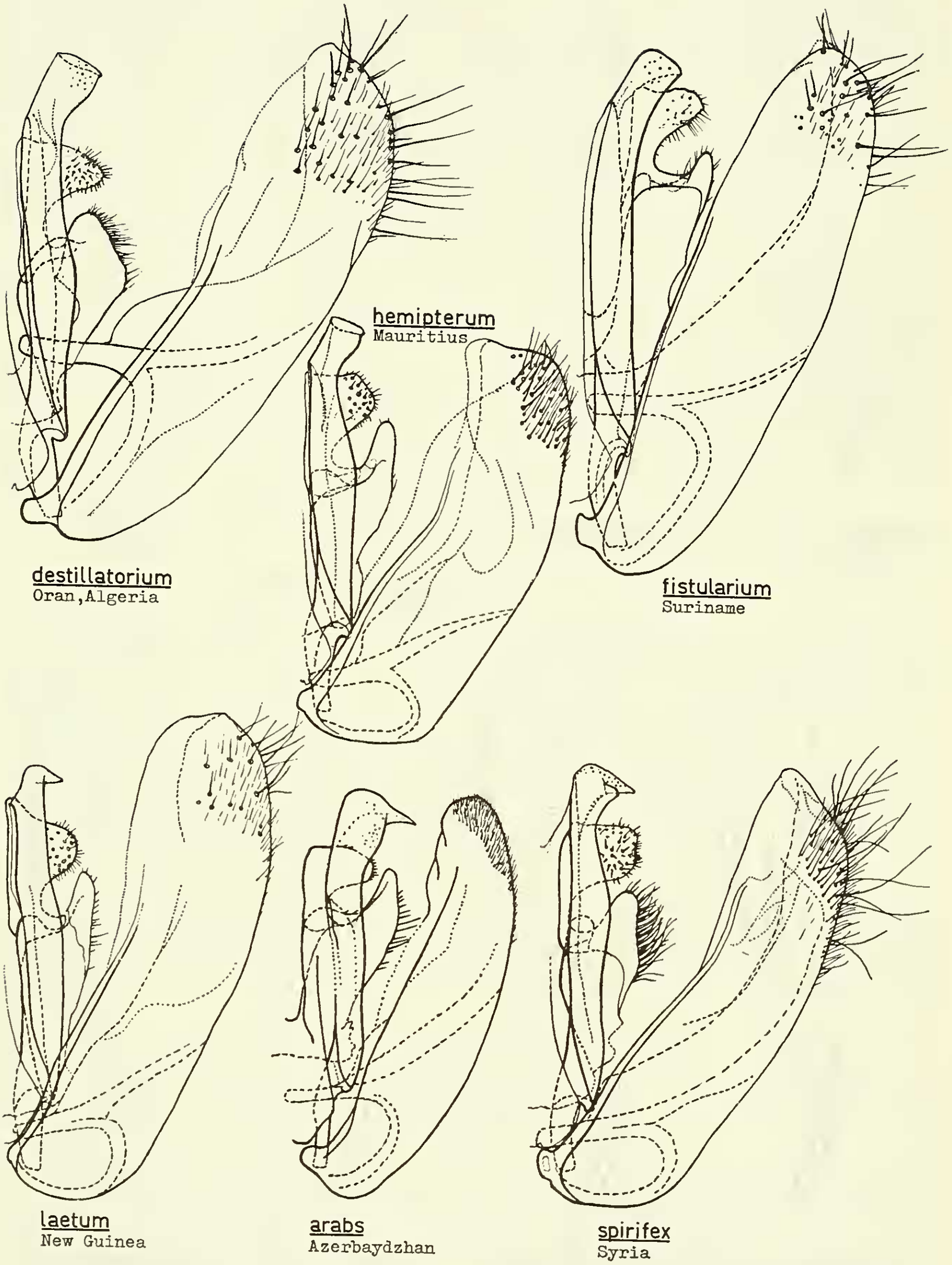
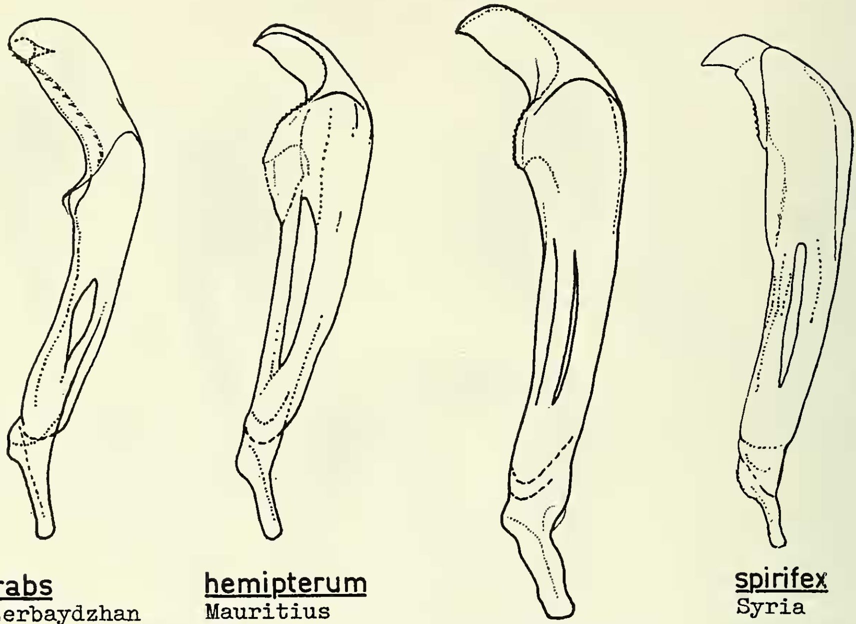


Fig. 21. Dorsal view of male genitalia of species of the *spirifex*-group

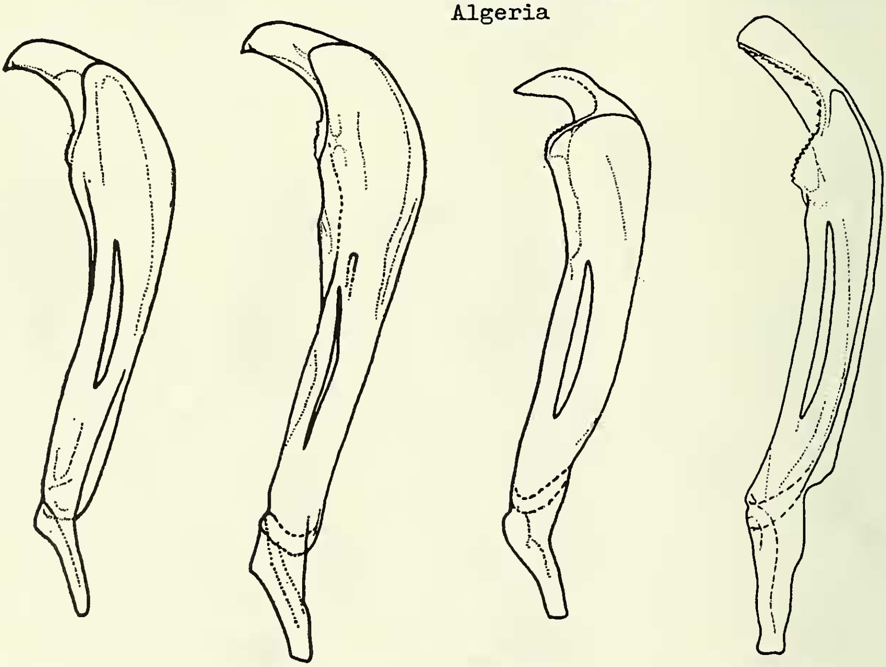


arabs
Azerbaydzhan

hemipterum
Mauritius

destillatorium
Algeria

spirifex
Syria



javanum
Java

javanum chinense
Kwangtung

laetum
New Guinea

fistularium
Suriname

Fig. 22. Inner side of left half of aedeagus of species of the *spirifex*-group

Thorax more elongate; length (from anterior vertical surface of pronotum to apex of propodeum) more than twice the distance between the outer margins of the tegulae (27 : 13); mesoscutum sharply striate, without punctures between the striae; thorax rather sparsely pubescent; second submarginal cell anteriorly slightly wider than the third; both cells rather strongly narrowed anteriorly (second cell width at base and at top 44 : 23 in left wing, 45 : 21 in right wing; third cell 37 : 20).

Some further notes on this specimen: interocular distance on vertex smaller than at the clypeus (25 : 31), antennal segments 3 : 4 = 25 : 20, length of gastral petiole = 83. Posterior ocelli as far from the eyes as from each other.

Femora I orange yellow with dark base, on femora II the dark colour extends a little beyond the middle, the outer third of femora III is black, not very sharply defined; all tibiae yellow, but tibiae II slightly infuscated near apex and tibiae III with irregularly defined dark ring on apical fourth; tarsi dark, except for the hind metatarsus, which is yellow with narrow dark ring at base and apex. Markings of antennae and thorax as described by Kohl (1918), but tegulae brownish on slightly less than the posterior half.

In a female from Baghdad, 1913, Mattanovich (MBUD), the second submarginal cell is slightly narrower anteriorly than the third (24 : 25 in left wing, 22 : 25 in right wing); otherwise this specimen agrees well with the one described above.

This is the only species in the subgenus *Sceliphron* of which the male is yet unknown.

Sceliphron (Sceliphron) hemipterum (Fabricius)

"Guêpe ichneumon", Réaumur, 1742, Mém. Hist. Ins. 6: 279, Pl. 28 Fig. 7 — Isle de France, leg. Cossigny [notes on bionomics].

Sphex hemiptera Fabricius, 1798, Entom. System., Suppl.: 244 — "Isle de France", coll. Bosc (MP!).

Sceliphron fuscum Klug, 1801, Neue Schrift. Ges. Naturf. Fr. Berlin 3: 566.

?Pelopoeus fuscus Lepeletier, 1845, Hist. Nat. Ins. Hym. 3: 311, ♀ — "Sans patrie", coll. Serville (location of type?) [invalid secondary homonym of *Sceliphron fuscum* Klug, 1801].

Sceliphron quodi Vachal, 1907, Rev. Ent. Caen 26: 144, ♀ — New Caledonia (MP!); Kohl, 1918, Annln naturh. Mus. Wien 32: 138 (unidentified species).

Sceliphron (*Pelopoeus*) *hemipterum*; Kohl, 1918, Annln naturh. Mus. Wien 32: 108.

The type of *Sphex hemiptera* F. is in the general collection of the Paris Museum; this collection also contains the types, a female and a male, of *Sceliphron quodi* Vachal. Very probably this species has been transported by French ships from Madagascar to New Caledonia.

Seychelles: series in NMW; 1 ♀ Mahé, Jan. 1953, E. S. Brown (*Sc. quodi* Vachal det. Nixon, pres. by C.I.E., 1954-113, BM); series from Mahé in MP.

Aldabra Is.: 1 ♂ June-July 1916, P. R. Dupont (BM).

Comoren Is.: 1 ♀ Johanna I., 77—58 (BM).

Nossi-Bé: series in NMW.

Madagascar: series in BM, MP, NMW; 1 ♀ Tamatave (NRS). — According to a note by Seyrig in MP, this species preys on Thomisidae, Argiopidae, Salticidae, etc.

Mascarene Is.: Mauritius, 1 ♀ 48—53, 1 ♀ 57—53, 1 ♀ 57—140; 1 ♀ 9 Nov. 1905, 1 ♂ 6 Febr. 1906, N. Manders (1915-147), all in BM; 1 ♀ Mauritius, Monchicourt (compared by the senior author with Fabrician specimen in Mus. Copenhagen, Aug. 1959); 3 ♀ Mauritius, from Mus. Berlin (ML); 2 ♀ "Isle de France" (= Mauritius), coll. Westermann (UZMC); 1 ♀ do., coll. Drewsen, 1 ♀ do., coll. Colsm. (UZMC); 1 ♂ Réunion, Poller (ML); series from Mauritius and Réunion (MP).

New Caledonia: 1 ♀ 1 ♂, types of *Sc. quodi* (MP); 3 ♀ Noumea (BM).

Sceliphron (Sceliphron) destillatorium (Illiger)

Ichneumon XVII, Schaeffer, 1766, Icon. Insect., I, Pl. 38 Fig. 1.

Sphex destillatoria Illiger, 1807, in: Rossi, Fauna Etrusca, 2nd. ed., 2: 94 — Italy.

Sphex pensilis Illiger, 1807, in: Rossi, Fauna Etrusca, 2nd. ed., 2: 94 — Italy.

Pelopoeus sardonius Lepeletier, 1845, Hist. Nat. Ins. Hym. 3: 308, ♀ — Sardinia, coll. Lepeletier (?MP).

Pelopoeus sardous Carruccio, 1872, Bull. Soc. Ent. Ital. 4: 275 [emendation of *P. sardonius* Lep.] [not in Kohl, 1918].

Pelopoeus pensilis var. *trinacriensis* Destefani, 1889, Naturalista Siciliano 8: 269 — Sicily [variety with entirely black gastral petiole].

Sceliphron (*Pelopoeus*) *destillatorium*; Kohl, 1918, Annln naturh. Mus. Wien 32: 100; Leclercq, 1955, Expl. Parc Nation. Upemba, Mission G. F. de Witte, etc. 34: 63.

This species is common and widely distributed in the Mediterranean subregion, and goes eastward through Central Asia to Tientsin (Fig. 19). It is represented from the Mediterranean area by good series in the museum collections in Copenhagen, London, Paris, and Vienna, and it seems hardly necessary to give a detailed list of locality records. We have therefore restricted the data to some borderline localities, to the localities in Asia and to those of the specimens in the Leiden Museum.

Material in the Leiden Museum. — S. France, 1 ♂ Vernets les Bains, Pyr. Or., Aug. 1896, C. Ritsema Czn; Spain, series from La Carolina, 700 m (Jaen), La Aliseda, 1000 m (Avila), and Tornavacas, 1200 m (Caceres), June 1961, 1 ♀ on *Mentha pulegium* L., 1 ♀ 4 ♂ on *Thapsia villosa*, Exc. Mus. Leiden; 3 ♀ Cadaqués, July 1961, L. B. Holthuis; Italy, 1 ♀ Passerini, 2 ♂ leg. Calkoen, 1 ♂ leg. Zeller; Dalmatia, 2 ♀ leg. Cantraine; Greece, 2 ♀ Portaria Pelionpass and Pentalophon, July 1963; Crete, 1 ♂ Knossos, 1 June 1966, J. van der Vecht; Morocco, 2 ♀ P. Lyautey and Ain Diab, Casablanca, June 1950, P. M. F. Verhoeff; Algeria, 2 ♀ Oran, leg. F. Ancey, 1 ♂ "Algeria", leg. Richter; Syria, 1 ♀ 1 ♂ Beyruth; Tschardschui, 1 ♀ leg. G. von Rennenkampf.

Further material examined. — Specimens from Gibraltar, Malta, Sicily, Crete, Cyprus, and Turkey (BM), from Sicily and Crete also in ZMB; Morocco, 1 ♂ Asni, Aug. 1930, T. D. A. and W. P. Cockerell (BM), 1 ♀ Haut Atlas, Jb. Ayachi, Tizi-n-Zou, 3 Aug. 1963, A. C. Pont (BM); 1 ♀ Bozen, July 1935, S. L. Tuxen (UZMC); 1 ♂ Klausen, S. Tirol, 1910, W. Ramme (ZMB); 1 ♀ Csehtelek, Bihar 46° N, 22° E, June 1910 (BM); 1 ♀ Moldavia, Berlad valley, leg. Montandon, coll. E. Saunders (BM); Iran, 1 ♀ Zabidan (Belut), in garden, 13 May 1954, P. Aellen (NMB); 1 ♀ Kaschgar, Raquette, 1 ♀ Sinkiang, Jarkent (NRS); 1 ♀ Songaria, Ala Tau (UZMC); 4 ♀ 2 ♂ Tientsin, 15 June 1906, F. M. Thomson (BM); 1 ♀ 1 ♂ do., on *Zizyphus jujuba*, June 1928, H. T. Feng (petiole of ♂ nearly entirely black) (USNM); 1 ♀ Woo-Fu, 21 June 1928 (CU). — Recently a single specimen has been found near Lublin in Poland (information received from Dr. W. J. Pulawski).

Sceliphron (Sceliphron) spirifex (Linné)

Sphex spirifex Linné, 1758, Syst. Nat., 10th ed.: 570 — "in Europa australi".

Sphex aegyptia Linné, 1758, Syst. Nat., 10th ed.: 569 — "in Aegypto".

Sphex spirifex atra Scopoli, 1786, Delic. faun. et flor. Insubr. I: 57, Pl. 23 Figs. 1 a-e,, 2A — Italy.

Sceliphron (*Pelopoeus*) *spirifex*; Kohl, 1918, Annln naturh. Mus. Wien 32: 86; Leclercq, 1955, Expl. Parc Nation. Upemba, Mission G. F. de Witte, etc. 34: 60.

Sceliphron spirifex occurs throughout Africa and Southern Europe and appears to be common almost everywhere in this extensive area (Fig. 19). It is represented by numerous specimens from the Ethiopian region and the Mediterranean subregion in all the larger European museums and we have therefore refrained from adding further localities to the long lists of records given by Kohl and by Leclercq.

An exception may be made for some island localities, not given by Kohl: Canary Is.: 2 ♂ Gran Canaria, leg. Duurlo (UZMC), 1 ♂ Las Palmas, 1926, leg. Hirtz (ZMB), 2 ♀ Teneriffe, S. Cruz, June 1926, leg. Liebe (ZMB); Cape Verde Is.: 1 ♀ S. Vicente, 8 Dec. 1945, Atlantide Exp. (UZMC); Fernando Po (BM). Furthermore some data on the northern and eastern limits of the area of distribution are of sufficient interest to be mentioned here: in France *S. spirifex* has been collected at Macon, 60 km North of Lyon (Berland, 1928), and at Carpentras (4 ♀ July 1951, P. M. F. Verhoeff; ML); for Italy Kohl (1918) gives "Trient in Tirol" as the northernmost locality; some marginal localities in eastern Europe are Tab (46°. 30′ N) in Hungary and Vsétin (49°. 20′ N) in Czechoslovakia (Zavadil and Snoflak, 1948). Eastward *S. spirifex* is said by Kohl (1918) to occur as far as Kisil near Kutschan, Bukhara, in Turkmenia (64° E), but this record (omitted in Fig. 19) seems to need confirmation.

Sceliphron (Sceliphron) javanum (Lepeletier, 1845) (Fig. 23—27)

This species is more widely distributed (Fig. 19, 24) than would appear from the records given in Kohl's paper (China, India and Ceylon to Borneo and Flores). *Sceliphron aemulum* Kohl from the Philippines is no more than a subspecies of *Sc. javanum*; furthermore there is a representative in the Papuan subregion, viz. *Sc. laboriosum* (Smith), a form which had remained unknown to Kohl.

Some remarkable aspects of the distribution of this polytypic species are: (1) the species is not represented in Celebes and the Moluccas; (2) the Papuan form seems to have reached its habitat via the Lesser Sunda Islands, but it is much more similar to the form inhabiting Flores and Sumba than to the subspecies occurring in Timor; (3) the marginal forms inhabiting Ceylon and Southern India, the Lesser Sunda Islands (except Timor) and the Papuan subregion (New Guinea, Aru Is.), are rather similar amongst each other and differ particularly from the central subspecies in the greater extension of the yellow colour on the hind legs (see Fig. 23); (4) the continental subspecies *chinense* and *petiolare*, and perhaps also *nalandicum*, are not sharply separated.

In certain large areas the distinguishing characters of the forms mentioned under (4) are constant enough, but elsewhere distinct signs of intergradation can be found. Further investigations in the areas where these subspecies meet are necessary for determining the extent of this phenomenon.

The various subspecies differ not only in colour pattern but also in the shape of the male genitalia (Fig. 25 and 26). Unfortunately the males of some subspecies have remained unknown to us.

Key to the subspecies of *Sceliphron javanum* (Lep.)

1. Hind tibiae black 2
— Hind tibiae yellow or brownish-yellow 6
2. Hind tarsal segments 1—3 yellow, fuscous at base and apex. Apical two thirds of femora I and apical half of femora II yellow. At least the apical third of the hind femora black, sharply separated from the basal yellow part. — Timor, Roti, ?Wetar. . . . . *timorense* van der Vecht
— Hind tarsal segments black 3
3. Hind femora yellow with usually ill-defined fuscous mark at apex above; if fuscous to black all round, the dark part is angularly produced on the inner side of the femur, and rarely covers more than the apical third on the outer side 4
— At least the apical third of the hind femora black, the dark part rather sharply separated from the basal yellow part 5

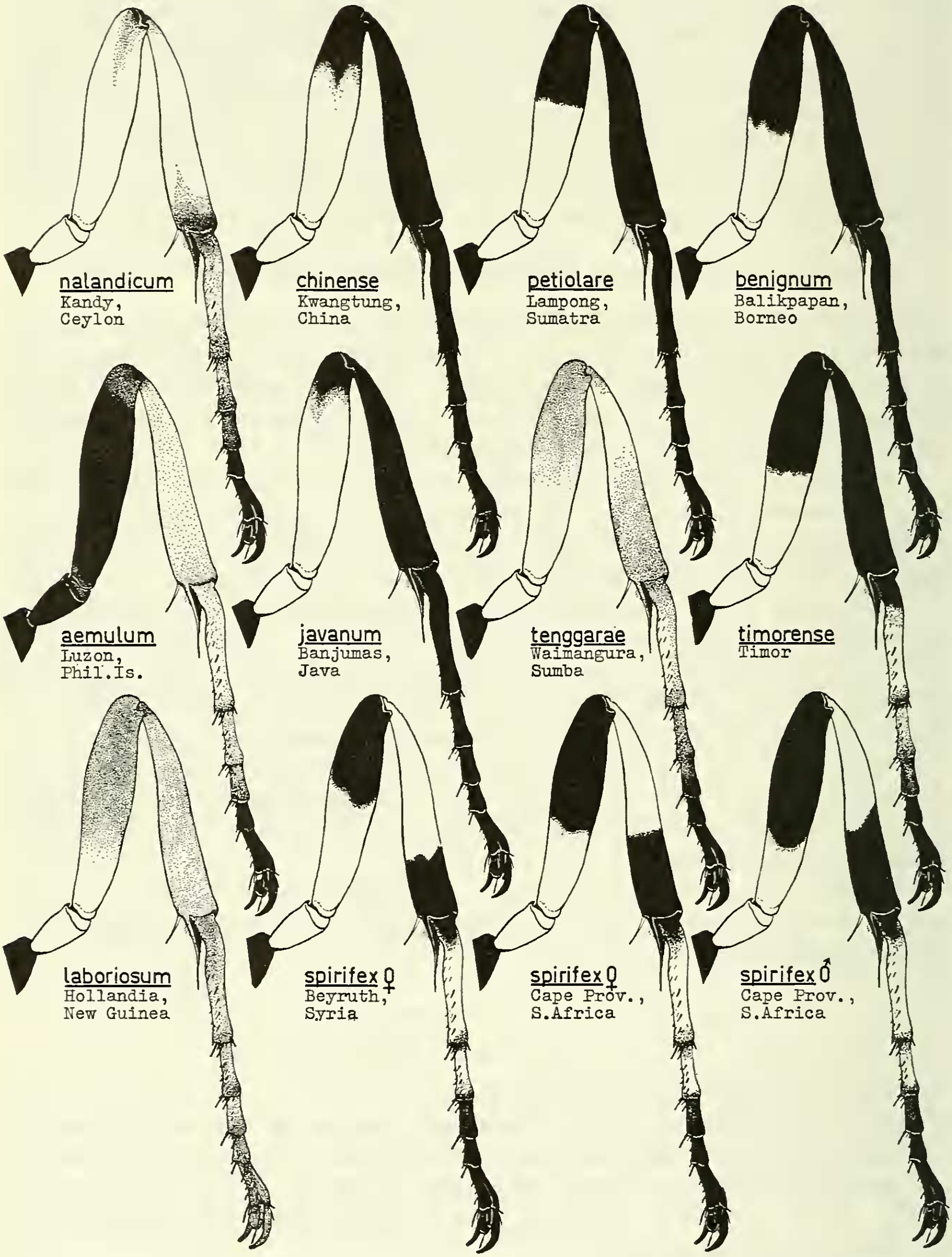


Fig. 23. Coloration of hind leg (♀) in the subspecies of *Sc. javanum* (Lep.) and in three specimens of *Sc. spirifex* (L.)

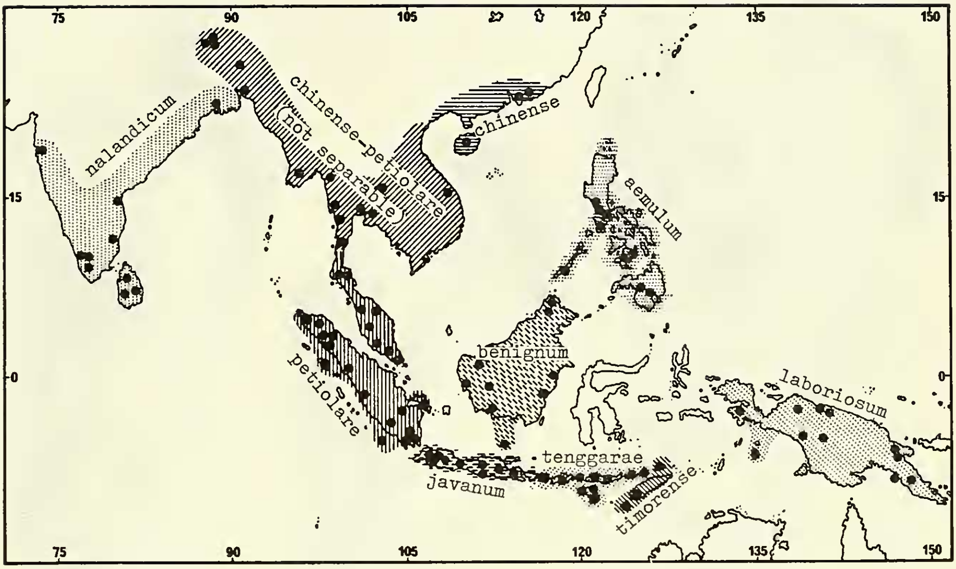


Fig. 24. Approximate distribution of the subspecies of *Sc. javanum* (Lep.)

4. Fore and mid femora black, brownish at apex; fore and mid tibiae orange-yellow to pale brown. — Java . . . . *javanum* (Lep.)

— At least apical third of fore and mid femora yellow to yellowish-brown; fore and mid tibiae yellow. — China . . . . *chinense* van Breugel subsp. nov.

5. Gastral petiole black. — Borneo and Bawean I. . . . . *benignum* Smith

— Gastral petiole yellow. — Sikkim, Burma, Thailand, Malaya, Sumatra, Banka, Enggano . . . . *petiolare* Kohl

6. Hind trochanters and femora black, the latter brownish at apex and with an irregular and narrow brown ring at base. Gastral petiole dark brown to black. Antennal segments 1 and 2 mainly, and often the under side of 3, ferruginous. — Philippines. . . . . *aemulum* Kohl

— Hind trochanters and femora yellow or brownish, sometimes more or less fuscous. Gastral petiole yellow. Antennae black, with only the anterior surface of the first segment (scape) yellow or reddish 7

7. Hind femora yellow with very small fuscous mark at apex above. Apical tarsal segments fuscous to black. — Ceylon, S. India, Bengal . . . *nalandicum* Strand

— Hind femora yellow at base only, the remaining part more or less brownish . . 8

8. At least the apical two thirds of the hind femora brown, greater part of tibiae uniformly yellowish-brown. Hind tarsal segments yellowish-brown. Apical half of femora I and II yellow. — New Guinea, Aru Is. . . . . . *laboriosum* (Smith)

— Apical half of hind femora and apical half of hind tibiae yellowish-brown to brown. Hind tarsal segments 3—5 fuscous to black. Femora I and II black with brownish apex. — Lesser Sunda Islands from Lombok to Alor or Wetar . . . . *tenggarae* van der Vecht

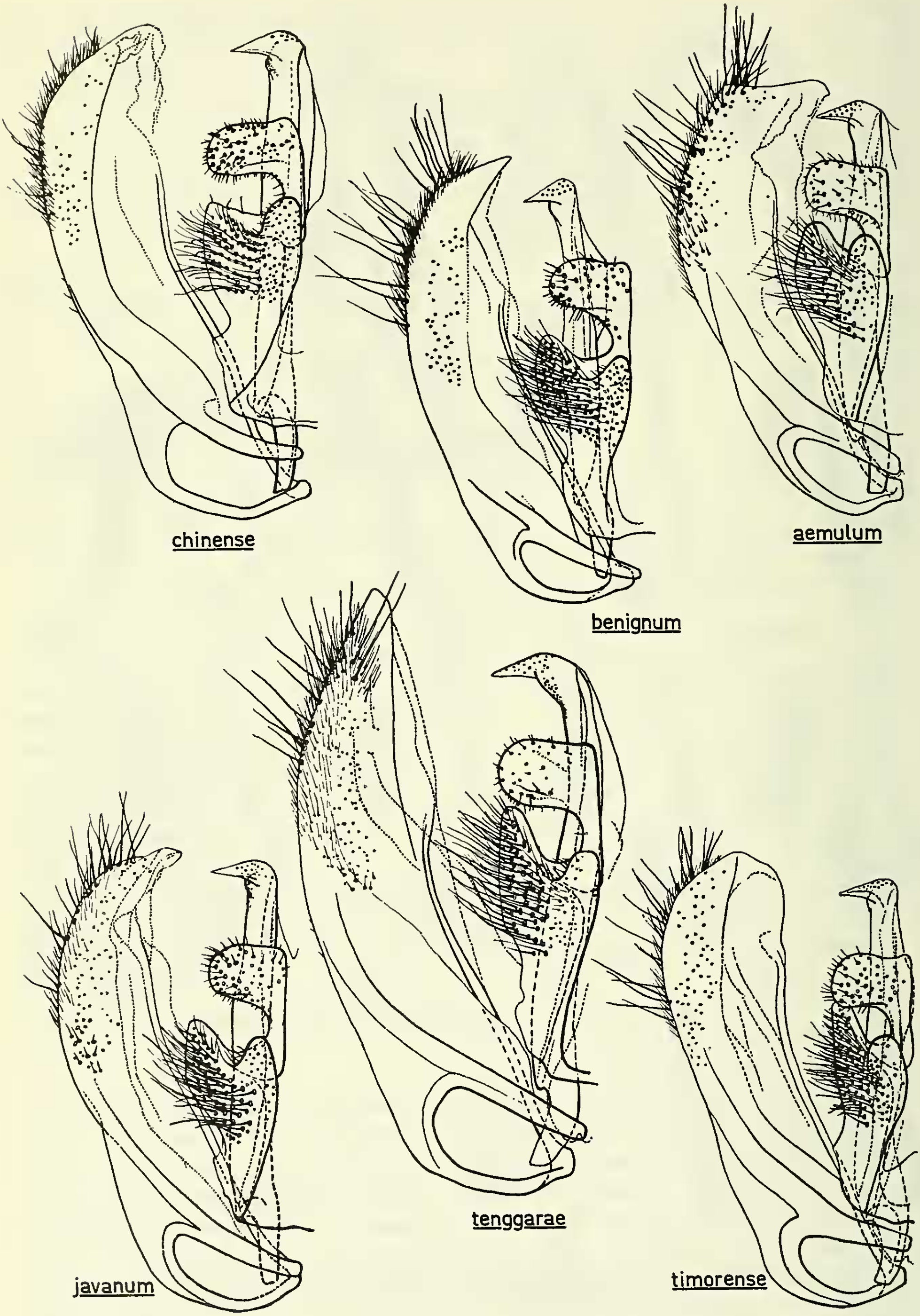


Fig. 25. Ventral view of male genitalia of six subspecies of *Sc. javanum* (Lep.)

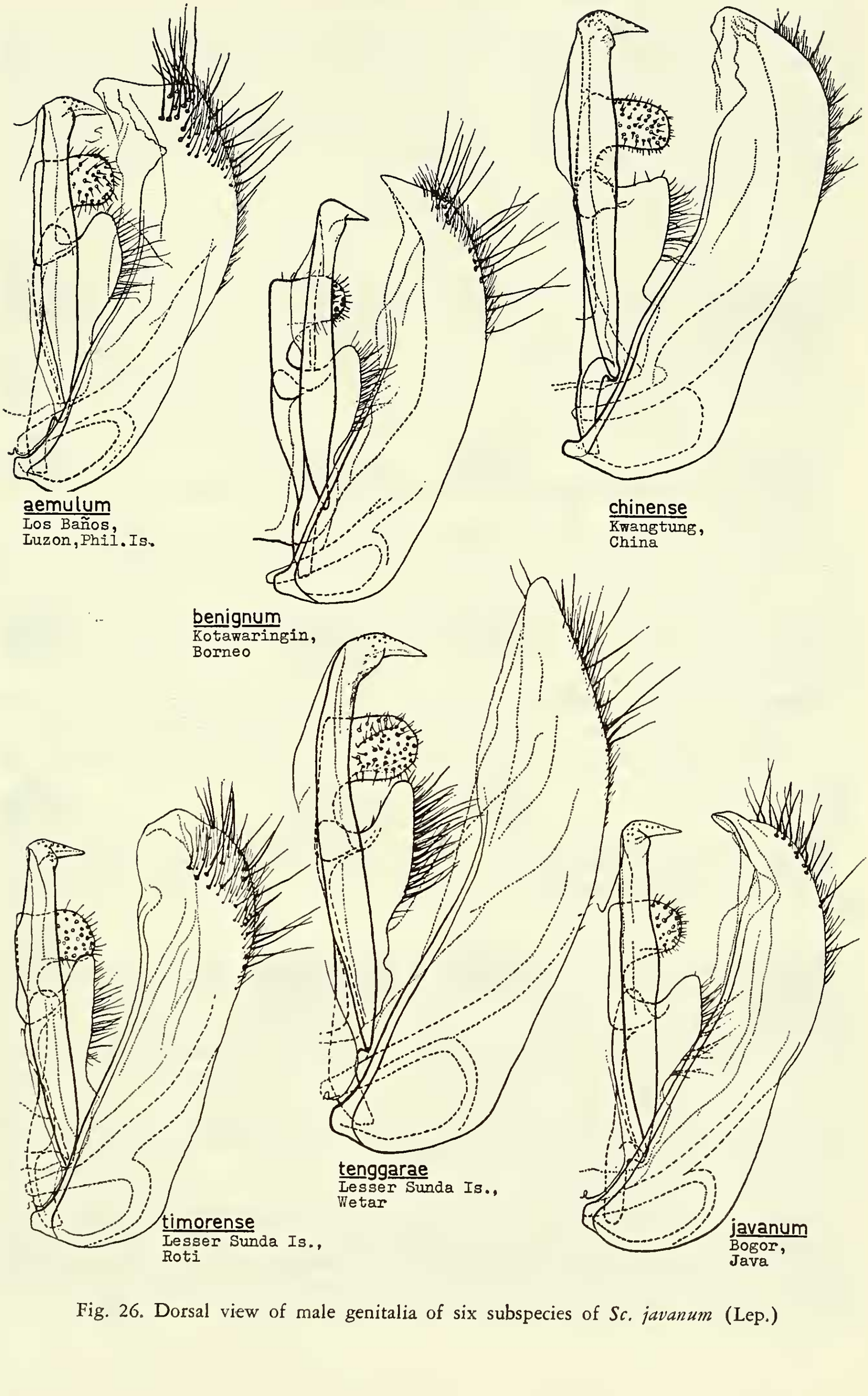


Fig. 26. Dorsal view of male genitalia of six subspecies of *Sc. javanum* (Lep.)

Sceliphron javanum nalandicum Strand

Pelopoeus spinolae; Smith, 1856, Cat. Hym. Brit. Mus. 4: 231 (Bombay; Ceylon) [misidentification of *P. spinolae* Lepeletier, 1845]. — Cameron, 1889, Mem. Manchr. lit. phil. Soc. (4) 2: 102 (cat.). — Bingham, 1897, Fauna Brit. India, Hym. 1: 237, ♀ ♂ (Ceylon; Southern India; Bombay; Bengal).

Sceliphron javanum var. *nalandicum* Strand, 1915, Arch. f. Naturgesch. 81A (5): 93, ♀ — "Nalanda und Kandy, Ceylon" (DEI). — Kohl, 1918, Annln naturh. Mus. Wien 32: 92, 93 (syn.: *Sc. spinolae* of Bingham).

Ceylon: 1 ♀ Peradeniya, Febr. 1902, 1 ♀ Henaratagoda, 19 Febr. 1902, Dr. Uzel, 2 ♀ Kandy, April and May 1902 (NMW); 1 ♀ Pundaloya, Green coll., "*Sc. spinolae* Lep. coll. Bingham, 96—30" (BM); 2 ♀ Sigiri, 1 ♀ Dambulla, 1 ♀ Matale, March 1910, E. Comber (BM); 1 ♀ "Ceylon", Felder (ML); 1 ♀ Kandy, 1 ♀ Peradeniya, both June 1953, 1 ♂ Puttalam, 23 Febr. 1954, F. Keiser (NMB; ML); 1 ♀ Colombo, 22 Febr. 1945, J. O. T. Howard (BM).

India: Western India, 1 ♀ Bombay, coll. C. G. Nurse, 1920-72 (BM). — Southern India, 4 ♀ 3 ♂ Coimbatore Distr., 1925, Col. Fraser (BM); 1 ♀ Coimbatore, April 1962, P. Susai Nathan (ML); 1 ♀ Malabar, coll. E. André (MP); 1 ♀ Nilgiri, Coonoor, M. Maindron (MP); 1 ♀ Mahé, Malabar coast, Maindron (MP). — Bengal, 1 ♀ "Bengale", Macé (MP); series from Barrackpore, coll. Rothney (OUM; identified as *intrudens* Sm. and *javanus* Lep.).

Sceliphron javanum chinense van Breugel subsp. nov.

♀ ♂ — Very similar to the subspecies *petiolare* and *javanum*, but differing by the greater extent of orange-yellow on fore and mid femora, which covers from ⅓ to ⅗ of the total length. The dark area at the apex of the hind femora is usually less extensive and less sharply defined than in subsp. *petiolare*, but larger than in subsp. *javanum*; on the inner side of the femur its irregular outline is more or less produced in the middle (Fig. 23 and 27).

The shape of the male genitalia (Fig. 25 and 26) supports the idea that the Chinese population(s) may be given separate subspecific status; the basal part of the volsella is more broadly truncate, and the digitus is longer and more slender than in the other subspecies of *javanum*.

China: prov. Kwantung, 3 ♂ Canton, 2 ♀ 1 ♂ Lo fao shan (1 ♀ 7 May, 1 ♀ 4 June '15), 2 ♀ Lung tao shan, 31 July and 4 Aug., 3 ♂ Mahn tsi shan, 14 and 15 May, 1 ♂ Ting wu shan, 16 May '16, all leg. Mell (paratypes, ZMB, 2 ♀ 2 ♂ ML). — Hainan Island, 1 ♀ Fan Heang, 20 June 1935, L. Gressitt (MCZ).

The following specimens are tentatively placed under this subspecies. They have the hind femora less extensively black at apex than the subsp. *petiolare*, but may differ in minor details from subsp. *chinense*. It seems probable that an area ranging from the Eastern Himalayas to the Chinese province Kwangtung harbours populations which combine to a varying extent certain characters of the subspecies *nalandicum, chinense,* and *petiolare*. Unfortunately the material from this area available at present is not extensive enough to serve as a reliable base for the study of the nature and the extent of the apparent intergradation between these subspecies.

Sikkim: 1 ♀ Runjit Valley, 1000 ft., May 1894, coll. C. T. Bingham, 96—30 (BM); very similar to *chinense*, but the basal half of tibiae III orange yellow, rather gradually darkening to brownish black on the apical half (?intergradation of *nalandicum* and *chinense*). 3 ♀ "Sikkim", coll. C. G. Nurse, 1920-72 (BM); hind tibiae black; 2 ♀ Sikkim, leg. F. A. Möller (UZMC); 1 ♀ Sikkim, April 1894, coll. Rothney (OUM); 1 ♀ Darjeeling (KVK); 1 ♀ do. (IRSNB).

Assam: 1 ♀ Khasia Hills, 96—135 (BM); hind femora as in *chinense*, hind tibiae black.

Tenasserim: 1 ♀ Moulmein, 15 Aug. 1893 (BM); 1 ♀ do., "*intrudens*", coll. Rothney (OUM); 1 ♀ Upper Tenasserim, Dawnat Range, Febr. 1891, 1 ♀ Middle Tenasserim, Haundraw Valley, Aug. 1894, 1 ♀ Lower Tenasserim, Tavoy, Oct. 1893, all leg. C. T. Bingham (BM); these specimens are very similar to subsp. *petiolare*, but the dark part at apex of femora III is slightly less extensive and less sharply defined (? intergradation between *chinense* and *petiolare*).

Indo-China: 1 ♀ Thuduc, 14 July 1923, R. Vitalis de Salvaza (ML); several specimens from Annam (MP); 1 ♀ Laos, Xiong Koh, 4 April 1920, R. Vitalis de Salvaza, 2 ♀ Tayninh, Nov. 1923 (IRSNB). — These specimens appear to be transitional to subsp. *petiolare*.

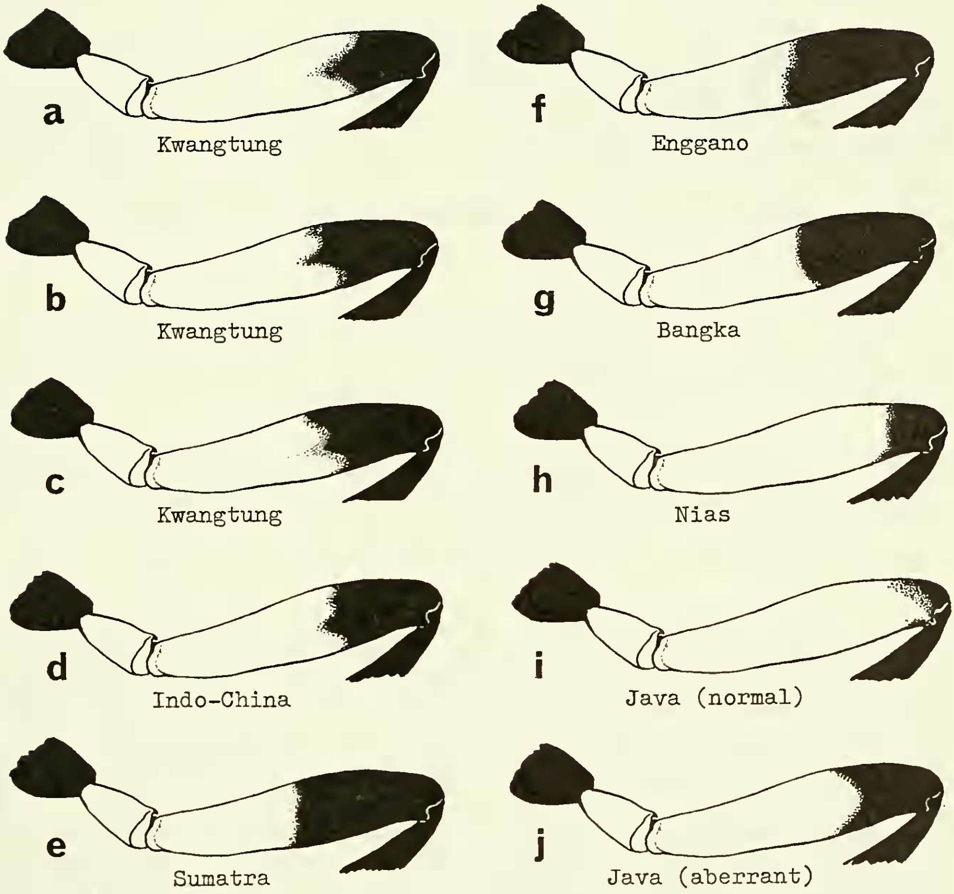


Fig. 27. Inner side of proximal part of hind leg (♀) of some specimens of *Sc. javanum* (Lep.). a and b: *chinense* subsp. n., Lo fao shan, Kwantung, China (ML and ZMB); c: do., Lung tae shan, Kwantung, China (ZMB); d: do., Indo-China, Thuduc, July 1923 (ML); e: subsp. *petiolare* Kohl, N. Sumatra, Deli, Tandjong Morawa (ML); f: do., Enggano I., leg. Wienecke (ML); g: do., Bangka I. (ML); h: ? subsp. *javanum* Lep., Nias, leg. Kleiweg de Zwaan (ML); i: subsp. *javanum* Lep., Java, Bogor, leg. Boerlage (ML); j: do., abnormally dark specimen, Java, Bodjong Kalong, 1935, Mrs. M. E. Walsh (ML)

Sceliphron javanum petiolare Kohl, status nov.

Sceliphron (*Pelopoeus*) *petiolare* Kohl, 1918, Annln naturh. Mus. Wien 32: 95, ♀ — "Deli, Sumatra" (1 ♀ ZMB!, no. 598, leg. L. Martin).

As we expected, examination of the type of *Sc. petiolare* Kohl has shown that this supposed species is based on a teneral specimen such as may be obtained by opening the cells of the clay nests. The colour is said to be "kastanienbraun" or "pechbraun" and this is characteristic for such incompletely developed specimens. The only structural character given by Kohl is that the length of the petiole exceeds that of the hind tibia, whereas it is equal to the length of the hind tibia in *javanum* Lep. In this respect, however, there appears to be some variation within the population(s) inhabiting Sumatra. In most of our specimens from the Northern part of this island the petiole is distinctly longer than the hind tibia (approximately 16 : 15), but in specimens from Palembang, Lampong Districts and Bangka the petiole is not, or only very little, longer than the hind tibia.

As a rule the gastral petiole is more extensively blackened at apex than in the Javan subspecies.

Thailand: series from Bangkok (MP); 1 ♀ "Siam, Mouhot" (labelled: "*javanus* St. Farg., *intrudens* Sm."!); series Peninsular Siam, Nakron Sri Tamarat (BM); 1 ♀ 2 ♂ N.W. Thailand, Ching Mai, Fang, 500 m, 12—19 April 1958, T. C. Maa (BISH); 1 ♂ S. Thailand, Banna, 108 m, 5—10 May 1958, T. C. Maa (BISH); 1 ♀ N.W. Thailand, Sattahib, 24 Nov. 1957, J. L. Gressitt (BISH).

Malaya: 1 ♀ "Mal. 29", in coll. Saunders, "*javanus* St. Farg." on blue label (det. F. Smith) (OUM); series "Malacca" (MP); many specimens from various localities, from northern border to Singapore (BM); 1 ♀ Perak, Kuala Kangsar, 1902, leg. Grubauer (CU); series "Perak, leg. Grubauer" (NMW); Pahang, 1 ♀ Tasek Bera, 28—31 March 1963, M. A. Lieftinck (ML); 1 ♀ Singapore, H. N. Ridley, 1904-101 (BM; apex of petiole black); 8 ♀ do., 1903—1922, various collectors (BM).

Sumatra: 2 ♀ "Sumatra", leg. Ludeking (ML); 1 ♀ "Sumatra", leg. S. Müller (ML); 2 ♀ "Sumatra" (NMW). — Northern Sumatra, 2 ♀ Atchin ("Atjeh") (ML); 1 ♀ Langkat, Namoe Dengas, 15 Febr., Jourin (MCZ); 1 ♀ Deli, E. Büttikofer (ML); 1 ♀ Deli, coll. Wüstnei (UZMC); 1 ♀ Labuan Bilik, leg. Dorsinfang (IRSNB); 2 ♀ Laut Tador, April 1951, R. Straatman (ML); 17 ♀ Tandjong Morawa, Serdang, Dr. B. Hagen (ML); 1 ♀ Tandjong Merah, 18 Dec. 1918, J. B. Corporaal (MR); 1 ♀ Kuala Simpang, March 1954, A. Sollaart (ML). — Central and South Sumatra, 1 ♀ Bua, 1 ♀ Solok, 1 ♀ Rengkeang Lulus, 1 ♀ Muara Labuh, 1 ♀ Surulangun, 4 ♀ Rawas, all leg. Sumatra-Exp. 1877—'78 (ML); 1 ♀ Palembang (ML); 2 ♀ Pagar Alam, 750 m, May 1935, Mrs. M. E. Walsh (BM; ML); 1 ♀ Benkulen, May 1935, Mrs. M. E. Walsh (ML); 10 ♀ do., Bukit Itam, June 1935 (BM). — Lampong Districts, 1 ♀ Tandjongkarang, 1922 (ML); 1 ♀ Damarkatja near Kasui, Sept. 1932, H. R. A. Muller (ML), 1 ♀ Kedaton Estate, 26 March 1937, J. van der Vecht (ML); 1 ♀ Oosthaven, 29 March 1937, Mrs. E. van der Vecht (ML); 1 ♂ Bergen Estate, Jan. 1953, A. Sollaart (ML). — Not located: 6 ♀ "Edi, Klein", 1 ♀ "Tjaili (?), Klein" (UZMC).

Bangka I.: 2 ♀ Bangka, Budding (ML); 3 ♀ Bangka, v. d. Bossche (ML); 2 ♀ Pangkalpinang, Febr.-March 1930, 1 ♂ Aer Mesu, Febr. 1932, 1 ♀ March 1955, J. van der Vecht (ML).

Enggano I.: 1 ♀ Enggano, Wienecke (ML). — Colour of hind femora as in Sumatran specimens.

The representation of this species on the island chain west of Sumatra deserves further study. It is noteworthy that the only available specimen from this area, a ♀ from Nias, is very similar to the Javanese subspecies (see below under *S. javanum javanum*).

Sceliphron javanum benignum (Smith)

Pelopoeus javanus Lepeletier; Smith, 1858, J. Proc. Linn. Soc. Zool. 2: 101 (Sarawak, Borneo; OUM).

Pelopoeus benignus Smith, 1859, J. Proc. Linn. Soc. Zool. 3: 15, ♀ — Sarawak, Borneo (OUM).

Sceliphron sintangense Strand, 1915, Archiv f. Naturgesch. 81A (5): 94, ♀ ♂ — "Sintang, Borneo" (DEI).

Sceliphron javanum var. *benignum*; Kohl, 1918, Annln naturh. Mus. Wien 32: 92, 93.

This form has been recorded by Kohl from British North Borneo (Darvel Bay and Kinabalu); the type locality of *sintangense* Strand is erroneously said to be in South East Borneo.

Borneo: 1 ♀ "Sar." (= Sarawak, leg. Wallace), coll. Saunders (type of *P. benignus*; OUM); 1 ♀ "Sar" ex coll. F. Smith, 79—22 (BM); 1 ♀ Sarawak, Mt. Matang, 120 m, 14 Nov. 1958, T. C. Maa (BISH); 1 ♀ Sarawak (MCZ); 1 ♀ Borneo, C. Hose, Comm. Inst. 1935—239 (BM); 3 ♀ Borneo, June 1882, Teweh (NMW); 2 ♀ Borneo, Baczes, 1886 (NMW and CU); 1 ♀ Borneo, 1888, ex coll. Tosquinet (IRSNB); 1 ♀ Borneo, S. Müller (ML); 1 ♀ Kinabalu (NMW); 5 ♀ N. Borneo, Samawang, Kudat, Bettotan, July-Aug. 1927, C. Boden Kloss & H. M. Pendlebury (BM); 2 ♀ Smitau, J. van Veldhuijzen, Borneo-Exp. (ML), 1 ♀ do., Febr. 1894, J. Büttikofer (ML); 1 ♀ West Borneo, Marbau Tjondong, April 1923 (MZB); East Borneo, 1 ♀ Balikpapan (ML), 1 ♀ Balikpapan, Wain River, Nov. 1950, A. M. R. Wegner (ML); 1 ♀ Tabang, Bengen River, 12 Sept. 1956 (ML), 1 ♀ Samarinda, 14 Dec. 1956, A. M. R. Wegner (ML); S. Borneo, 1 ♀ from Staudinger (ML), 1 ♂ Kotawaringin, March 1953, leg. Inen (ML).

Bawean I.: 7 ♀ "Bawean, Regenzeit, H. Fruhstorfer" (ML).

Sceliphron javanum aemulum Kohl

Sceliphron (*Pelopoeus*) *aemulum* Kohl, 1918, Annln naturh. Mus. Wien 32: 94, ♀ — "Mindanao, Philippinen" (NMW).

Sceliphron "intrudens (Smith)"; Williams, 1919, Bull. Hawaii. Sugar Pl. Ass., Ent. Ser. 14: 120, Fig. 57, 58 (bionomics in Luzon) [incorrect identification].

Sceliphron luzonensis Rohwer, 1921, Phil. J. Science 19: 674, ♀ — Mt. Maquiling, Laguna, Luzon (type ♀, no. 23637, USNM).

Sc. aemulum Kohl is another species based by Kohl on a wasp with brownish body colour which is a teneral specimen of a black-bodied species (see under *Sc. javanum petiolare* Kohl). Rohwer compared his *Sc. luzonensis* with *Sc. intrudens* (Sm.) from Celebes, but apparently he did not know Kohl's monograph and he overlooked the important character of the shape of the hind coxae, by which *Sc. javanum* is at once distinguished from *Sc. intrudens.*

According to Kohl the first antennal segment is yellow and the two following segments rusty yellow; Rohwer describes the antennae as black, with only the scape and pedicellum "rufo-piceous". In the specimens we have seen the first and second segments are distinctly rusty or reddish yellow; the third segment is rusty yellow beneath, at least at the base, but rather dark above.

Luzon: 1 ♀ Los Baños, 1913, leg. Ledyard (ML), 1 ♂ do., July 1918, leg. C. S. Banks (ML), 1 ♂ do., July 1921, F. X. Williams (ML), 1 ♀ do., 26 Aug. 1926, P. M. Ungos (MCZ), 4 ♀ do., 100—1500 ft., 31 May—5 June 1947, CNHM Phil. Zool. Exp., F. G. Werner leg. (CNHM), 3 ♀ do., March 1953, Sept. 1953 and July 1954, Townes family (coll. Townes; ML); 1 ♀ Mt. Maquiling, 60—100 m, 22 Aug. 1925, leg. N. O. Flores (MCZ); 1 ♀ do., 400 ft., 1 June 1932, F. C. Hadden (BISH); 1 ♀ do., 27 Jan. 1931, F. S. Revira (UMMZ); 1 ♀ Maquiling, 18 Febr. 1954, E. Dagang (BPI); 1 ♀ Atimonan, July 1963, A. Concepcion (BPI).

Mindoro: 2 ♀ Alcate, Vict., 6—9 April 1954, Townes family (coll. Townes; ML).

Negros: 3 ♀ Negros Or., Mt. Canlaon, 3600 ft., 28 April—7 May 1953, Townes family (coll. Townes; ML).

Cebu: 1 ♀ Cebu City, Camp 7, 25 May 1952, C. R. Baltazar (BPI).

Leyte: 1 ♀ Palo, 27 June 1951 (BISH); 1 ♀ 10 miles East of Tacloban, 19 Aug. 1945, D. G. Hall (coll. KVK).

Palawan: 1 ♀ Brooke's Point, sea level, 1 ♀ Tigoplan River Valley, Brooke's Point, 180 ft., 24 and 29 April 1947, resp., CNHM Phil. Zool. Exp., F. G. Werner leg. (CNHM).

Mindanao: 1 ♀ Mindanao (NMW; type of *Sc. aemulum* Kohl); 1 ♀ Davao Prov., Calian, July, 3 ♀ Mt. Apo, 2000 ft., Oct., leg. C. F. Clagg (MCZ); 1 ♂ Agusan, Los Arcos, 19—23 Nov. 1959, C. M. Yoshimoto (BISH).

The collection of the IRSNB contains 1 ♀ with label: "Ins. Philipp., coll. Ballion, ex coll. Puls".

Sceliphron javanum javanum (Lepeletier)

Pelopoeus javanus Lepeletier, 1845, Hist. Nat. Ins. Hym. 3: 309, ♀ — "Java" (type ex coll. Serville in coll. Spinola, Mus. Torino).

Sceliphron (*Pelopoeus*) *javanum* [err.: "Smith"!]; Kohl, 1918, Annln naturh. Mus. Wien 32: 92.

Sceliphron spec., Menzel, 1928, Rev. Suisse Zool. 35: 265—270, figs. (notes on bionomics in Java; dimensions of nest: 13 × 10 × 4 cm! indicate that the notes refer to *Sc. javanum*).

We have some doubt concerning the identity of the type of *Pelopoeus javanus* Lep., described from material in the collection of Mr. Audinet-Serville (now in Zool. Mus. Univ. Turin). Lepeletier (1845) describes the colour of the hind legs as follows: "les deux (pattes) postérieures noires, avec les trochanters et la base des cuisses, jusque passé le milieu, de couleur jaune". The Sumatran form seems to fit this description better than the Javan race. Occasionally, however, specimens are found in Java which resemble the Sumatran subspecies very closely (see Fig. 27). It would therefore be difficult to prove that the type is incorrectly labelled, even if its coloration is not typical for the Javan race.

In Java this wasp is fairly common in cultivated areas, up to about 1000 m above sea level; it is, however, generally less numerous than *Sc. madraspatanum*.

Java: 1 ♀ Java, Kuhl & van Hasselt (ML); 1 ♀ Java, Reinwardt (ML); 1 ♂ Java, Mulié (ML); 2 ♀ Java, coll. Drewsen (UZMC), 1 ♀ "Java, coll. Schramm" (MCZ); 1 ♀ Java, "49/5" (BM); 1 ♀ Java, leg. Horsfield, "E.I.C., 60—15" (BM); 1 ♀ without locality label, "*Sc. intrudens* Sm." ex coll. Bingham (BM); 1 ♀ Buitenzorg (= Bogor), 1881, "Smith coll. pres. by Mrs. Farren White, 99-103" (BM). — West Java, 1 ♀ West Java, Febr. 1937, Mrs. M. E. Walsh (BM); Udjong Kulon, 3 ♀ Teluk Peutjang and Tjigeunteur, July 1955, A. M. R. Wegner (ML); 1 ♀ 2 ♂ Batavia (= Djakarta), 1907, 1908, E. Jacobson (ML); 2 ♀ Batavia, leg. Westermann (1 ♀ Dec. 1816) (UZMC); 1 ♀ Buitenzorg (= Bogor), Dr. J. G. Boerlage (ML), 5 ♀ 4 ♂ Buitenzorg, 1928—1935, J. van der Vecht (ML), 6 ♀ Djampang Tengah, 1933-5, Mrs. M. E. Walsh (ML), 2 ♀ Bodjongkalong, Sept. 1935, Mrs. M. E. Walsh (ML); 2 ♀ Sukabumi (MR), 2 ♀ do. (IRSNB) — Central Java, 3 ♀ Ambarawa, leg. Ludeking (ML), 2 ♀ Mt. Slamet, Baturraden, May 1934, F. C. Drescher (ML), 1 ♀ Baron, Gunung Sewu, March 1911, E. Jacobson (ML). — East Java, 1 ♀ Rembang, 1 ♀ Kediri, leg. Piepers (ML); 1 ♀ Ngantang (Rembang) (MM); 1 ♀ Idjen Mts., July 1940, H. Lucht (ML).

Nias: 1 ♀ Mt. Sitoli, leg. Kleiweg de Zwaan (ML). — This specimen is provisionally placed here because in the coloration of the hind femora (fig. 27) it is closer to *javanum* than to *petiolare*: however, the yellow and the black areas are more sharply separated than in *javanum*.

Sceliphron javanum tenggarae van der Vecht

Sceliphron (*Pelopoeus*) *javanum* "var. *nalandicum* Strand"; Kohl, 1918: 94 (Flores; Lombok).

Sceliphron javanum tenggarae van der Vecht, 1957, Verh. naturf. Ges. Basel 68: 369, ♀ ♂ — Sumbawa; Komodo; Flores; Sumba (type ♀, Flores, ML).

The subspecies of *javanum* occurring in the Lesser Sunda Islands (Indonesian name: Nusa Tenggara) is very similar to subsp. *nalandicum* Strand from Ceylon and to subsp. *laboriosum* from Aru and New Guinea.

In addition to the material recorded in 1957 we have examined the following specimens.

Lombok: 6 ♀ 2 ♂ Sapit, 2000 ft., April 1896, H. Fruhstorfer (NMW; 1 ♂ UZMC); 1 ♀ 1 ♂ Swela, 22—28 March 1927, Dr. B. Rensch (ZMB); 2 ♀ "Lombok", Carl Aurivillius (NRS).

Sumbawa: 2 ♀ 1 ♂ Bima, "ex coll. Bingham, 1902-120" (BM); 1 ♀ Sumbawa besar, West Sumbawa, 24 April—2 May 1927, Dr. B. Rensch (ZMB); 1 ♀ East Sumbawa, 2—4 June 1927, 1 ♀ Dompoe, East Sumbawa, 24—25 May 1927, Dr. B. Rensch (ZMB).

Flores: 3 ♀ Mborong, 30—31 March 1958, A. M. R. Wegner (MZM; ML); 2 ♂ Rana Mese, 1300—1500 m, April 1958, A. M. R. Wegner (MZB); 1 ♀ 1 ♂ Flores, 1876, coll. Tosquinet (IRSNB).

Solor: 1 ♀ leg. Hoedt (ML).

Alor: 1 ♀ Kalabahi, 30 March 1957, A. M. R. Wegner (ML).

The collection of the Leiden Museum also contains 2 ♀ 3 ♂ labelled "Wetar, leg. Schädler", but these specimens differ from those recorded above in having the apical half of the hind femora and tibiae more or less strongly infuscated. They are thus transitional to the subspecies *timorense* of Timor. Since the latter island is less distant from Wetar than the distribution area of typical *tenggarae*, it seems very well possible that the two forms intergrade in Wetar. In this connection it may be noted that the Leiden Museum possesses a female of subsp. *timorense* which bears a label with the same data as the series of atypical *tenggarae* recorded above (Wetar, 1898, leg. Schädler). For the moment, however, we hesitate to attach much value to this fact, for Schädler's material was evidently labelled after its receipt by the Leiden Museum, and it seems possible that the latter label is incorrect. Evidently further collecting in Wetar is necessary to determine the status of the population inhabiting this island.

Sceliphron javanum timorense van der Vecht

Pelopoeus spirifex Linn.; Smith, 1871, J. Proc. Linn. Soc. Zool. 11: 360 ("Timor") [misidentification].

Sceliphron javanum timorense van der Vecht, 1957, Verh. naturf. Ges. Basel 68: 369, ♀ ♂ — Timor; Roti; Wetar (type ♀, Timor, ML).

In addition to the specimens studied in 1957, the senior author has seen 1 ♀ from Pulo Semau (close to Timor, near Kupang) and 1 ♀ "Timor, Cupan" (= Kupang), both collected in April 1889 by L. Loria (MCG).

Sceliphron javanum laboriosum (Smith)

Pelopoeus laboriosus Smith, 1859, J. Proc. Linn. Soc. Zool. 3: 159, ♀ — "Aru", leg. Wallace (OUM).

Sceliphron lorentzi Cameron, 1911, Nova Guinea 9, Zool.: 201, ♀ — "Bivak Island", Lorentz River, South New Guinea (MA).

The type of *Sc. lorentzi* is in the collection of the Zoological Museum at Amsterdam, where the senior author examined it in 1934. Cameron's description is incorrect in several details. The sculpture of the thorax is not different from that of *Sc. javanum javanum*;

not the metapleura are "striated", but the sides of the propodeum; the apex of the first and second abdominal segments is not "longitudinally striate", but these parts had been wet and the appearance of the tomentum has been mistaken for surface sculpture.

Both *P. laboriosus* and *Sc. lorentzi* were placed by Kohl (1918) under the unidentified species at the end of his monograph.

Aru: 1 ♀ with blue label "Aru", Saunders coll. (OUM; type of *P. laboriosus* Smith); 1 ♀ "Aru", "F. Smith coll. 79-22" (BM; this specimen has two Strepsiptera under tergite 4); 1 ♀ "Aru, Wallace", Drewsen coll. (UZMC).

New Guinea: West New Guinea, 1 ♀ Vogelkop, Bomberi, 700—900 m, 10 June 1959 (BISH); 1 ♀ Mamberamo River, Prauwenbivak, 1920, W. C. van Heurn (Van Overeem Exp., MZB); 1 ♀ Hollandia, June 1937, W. Stüber (ML); 2 ♀ Genjam, 40 km West of Hollandia, 100—200 m, 1—10 March 1960, T. C. Maa (BISH); 2 ♀ Hollandia, Febr. 1957, J. van den Assem (ML); 2 ♀ Ifar near Hollandia, Aug. 1957, G. den Hoed (ML), 1 ♀ do., 300—600 m, 22 June 1959, T. C. Maa (BISH); 10 ♀ Sibil, Star Range, 1260 m, 15 April—31 Aug. 1959, Netherlands New Guinea Exp. (ML; 1 ♀ USNM). — Southwest New Guinea, 1 ♀ Bivak Island (MA, type of *Sc. lorentzi* Cameron). — North East New Guinea, 1 ♀ Finisterre Range, Saidor-Sibog, 27 May—5 June 1958, W. W. Brandt (BISH); 1 ♀ Kassam, 1350 m, 48 km East of Kainantu, 28 Oct. 1959, T. C. Maa (BISH). — Papua, 1 ♀ Kokoda, 1200 ft., Sept.-Oct. 1933, L. E. Cheesman (BM); 2 ♀ Yule Island (MP).

Sceliphron (Sceliphron) laetum (Smith)

The colour pattern of this beautiful species is fairly constant. More or less distinct deviations from the "normal" coloration appear to occur in two parts of the area of distribution, viz. in Western Australia and in the Moluccas.

Already Smith (1856) noted that specimens from Swan River have the yellow spots in scutellum and "metathorax" (= propodeum) nearly or quite obsolete. In 1910 Turner described such specimens as "st. *cygnorum*", giving the following colour characters: "the yellow markings are absent from the scutellum, postscutellum, apex of the median segment, and fourth abdominal segment; the base of the intermediate femora is marked with black and the yellow on the pronotum and fifth abdominal segment is more or less reduced".

Although we have seen several specimens from Western Australia, none was found to agree exactly with this description, for the scutellum and postscutellum were always marked with yellow. Probably the most reliable character of the melanistic form of this area is the absence of a yellow band on the fourth gastral tergite. We have observed this character in specimens from Yelbeni and Midland, but from the first mentioned locality we have also seen a specimen with a distinct yellow band on tergite 4 and one with a reduced band. At this moment we must conclude that our data do not permit to say with certainty whether the darker form may be regarded as a subspecies. According to Turner (l.c.) the form *cygnorum* is furthermore characterized by certain peculiarities of the sculpture of the propodeum and the shape of the submarginal cells; we have been unable, however, to find constant differences in these respects between specimens from Western Australia and from other areas.

On the other hand the available material from the Northern Moluccas indicates that the population(s) occurring in these islands are sufficiently different from typical *laetum* to deserve subspecific status.

Sceliphron laetum laetum (Smith)

Pelopoeus laetus Smith, 1856, Cat. Hym. Br. Mus. 4: 229, ♀, Pl. 7 Fig. 1 — "Australia (Port Essington; Macintyre River; Swan River); Ceram" (BM; lectotype by present designation = 1 ♀ no. 21-610, Macintyre River, "51/36").

Sceliphron laetum "st. *cygnorum* st. n." Turner, 1910, Proc. Zool. Soc. Lond. 1910: 343, ♀ — "South Western Australia" (BM, type no. 21.611, "N. Holland, 44/4").

Sceliphron laetum; Kohl, 1918, Annln naturh. Mus. Wien 32: 95. — Krombein, 1949, Proc. Hawaii. ent. Soc. 13: 370, 386 (Guam, Mariana Is.: Arakabesan and Koror Is., Palau Is.). — Id., 1950, ibid. 14: 138 (Yap, Caroline Is.).

Celebes: North Celebes, Menado, 1 ♀ June 1949, 2 ♀ Aug. 1949, C. J. H. Franssen (ML). This is the first record of this species from Celebes. The occurrence of *Sc. laetum* in Menado and direct environs (Experiment Garden Mapanget) is very probably due to a recent introduction.

Buru: several specimens of both sexes, collected by Denin, 1913, 1914 (one female stylopized!) (MZB; ML; NMW); 2 ♀ 1 ♂ Namlea, 1925 (ML); 5 ♀ Station 1, Febr.-Dec. 1921, L. J. Toxopeus (MA; ML); 1 ♀ Waspait, 1 ♀ Balubalu, June 1959, A. M. R. Wegner (ML).

Amboina: 1 ♀ Amboina (MBUD).

Salawati: 2 ♀ Salawati, leg. Bernstein (ML).

Kai Is.: 1 ♀ Tual, 1923, Th. Mortensen (UZMC).

Aru Is.: 3 ♀ 3 ♂ Aru Is., leg. Rosenberg (ML), 1 ♀ Aru (MBUD).

Schouten Is.: 1 ♀ Biak, 10 Febr. 1952, L. D. Brongersma (ML), 1 ♀ Base Biak (W. of Sorido), March 1955, L. D. Brongersma c.s. (ML), 1 ♀ do., L. van der Hammen (ML).

New Guinea: 3 ♂ "New Guinea, ter Poorten" (MZB). — Vogelkop, 1 ♀ Sorong, June 1938, L. J. Toxopeus (MZB); 1 ♀ Doom I. near Sorong, 22 March 1952, L. D. Brongersma (ML); 1 ♀ Klamono, Dec. 1947, Schumacher (NMB). — North West New Guinea, 1 ♀ Motorbivouac, Aug. 1926, Docters van Leeuwen (Sterling Expedition; ML); 1 ♀ Koiwi River, 6—22 Febr. 1911, K. Gjellerup (ML); 1 ♀ Hollandia, harbour, 5 Aug. 1952, L. D. Brongersma (ML); 1 ♀ do., governor's palace, Aug. 1952, L. D. Brongersma (ML); 1 ♂ do., 13 Oct. 1954, L. D. Brongersma & L. B. Holthuis (ML); 1 ♀ do., 13 March 1960, T. C. Maa (BISH); 1 ♂ Bewani Hills near Hollandia, March 1937, W. Stüber (ML); 5 ♀ 1 ♂ Ifar, 300 m, Sept.-Nov. 1956, J. van den Assem (ML), 1 ♀ 4 ♂ do., 8—13 Sept. 1959, C. van Heijningen (ML); 2 ♂ Genjem, 25 Oct. 1956, J. van den Assem (ML); 1 ♀ Sentani Lake, Joka, 80 m, 21 Oct. 1954, L. D. Brongersma & L. B. Holthuis (ML). — South West New Guinea, 2 ♀ Merauke, H. P. Winkelman (ML), 1 ♀ do., Dec. 1957, Mrs. D. Bergman (ML); 1 ♀ 2 ♂ Mindiptana, Aug. 1959, from nest, leg. fr. Monulphus (ML). — North East New Guinea, 1 ♀ 2 ♂ Friedrich Wilhelmshafen, 1896, 12 ♀ 20 ♂ Astrolabe Bay, Stephansort and Erima, 1896—7, all leg. L. Biró (MBUD; 1 ♀ 1 ♂ ML); 1 ♀ Bubia, 4 Nov. 1959, T. C. Maa (BISH); 1 ♀ Lae, sea level, 4 June 1961, 1 ♀ Wau, Morobe Distr., 1200 m, 2 June 1962, J. Sedlacek (BISH); 1 ♀ Torricelli Mts., Siaute, 9—11 Nov. 1958, W. W. Brandt (BISH); 2 ♂ Finschhafen, sea level, Morobe Distr., 15—25 Sept. 1964, H. M. van Deusen, 7th Archbold Exp. (AMNH). — Papua, 5 ♀ 1 ♂ Rigo, July 1889, 1 ♀ Waicunina, June 1890, 1 ♀ Hula, Jan. 1891, 1 ♀ Kamali, Febr. 1891, 3 ♀ Kapakapa, May-June 1891, all leg. L. Loria (MCG; 2 ♀ ML); 1 ♂ Port Moresby, Febr. 1918, 1 ♀ do., Febr. 1920, J. T. Zimmer (CNHM). — Papua, 1 ♀ Rambuso, Sudest Is., 24 Sept. 1956, 5th Archbold Exp., L. J. Brass (AMNH); 1 ♂ Goroka, 1530 m, 30 April—3 May 1959, 1 ♀ Brown River, Central Distr., 22 April 1959, 1 ♂ Roku, Central Distr., 23 April 1959, all C. D. Michener (BISH).

Bismarck Is.: 1 ♀ "Neu Pommern" (MBUD); 1 ♀ Manus Is., Lorengau, sea level, 15—29 Dec. 1959, T. C. Maa (BISH); 2 ♀ 2 ♂ Puktas, Baining Mts., 22 Nov. 1957, J. Smart (BM).

Solomon Is.: Bougainville, 1 ♂ 2 June 1956, J. L. Gressitt (BISH); 4 ♂ Aropa near Kieta, 1960, R. W. Paine (ML). — New Georgia, Munda, 1 ♀ 21 July 1959, T. C. Maa (BISH). — Guadalcanal, 2 ♀ Lunga and Tenaru, Aug. 1928, R. W. Paine (BM); several specimens 1933—'34, H. T. Pagden (coll. Pagden; ML); 1 ♀ 2 Sept. 1945, H. M. Malkin (CAS); 4 ♀ 2 ♂ Lunga River Bridge, July-Aug. 1960, J. Schenk (PV). — Tulagi, several specimens 1933—'34, H. T. Pagden (coll. Pagden; ML). — Malayta, 1 ♀ 1 ♂ Jan. 1932, R. A. Lever (BM). — Russell Is., 1 ♀ Lingatu, June 1932, R. A. Lever (BM).

Guam: 1 ♀ Pt. Oca, 3 Aug. 1945, G. E. Bohart and J. L. Gressitt (CAS; evidently a recent introduction; see Krombein, 1949).

New Caledonia: 1 ♀ 7 ♂ Noumea, Anse Vata, Jan.-Febr. 1957, J. Rageau, no. 1957-149 (BM).

Australia: 8 ♀ 2 ♂ "Nov. Holl.", coll. Drewsen (UZMC); 2 ♀ "Austr. boreal.", coll. Drewsen (UZMC); 3 ♀ "Terra van Diemenii", leg. Parzudaki (UZMC). — Queensland, 1 ♂ Halifax, May 1919, F. X. Williams (ML); 1 ♀ 1 ♂ Brisbane, Moorooka, Jan. and Nov. 1944, E. F. Riek (ML); 1 ♀ Brisbane, Nov. 1955, F. G. T. Smith (ML). — N.S. Wales, 2 ♀ Marrickville near Sydney, 15 and 29 Dec. 1955, R. H. Mulder (coll. P. M. F. Verhoeff); 1 ♀ Cooma, Dec. 1956, J. Sedlacek (LAM); 1 ♀ Casula, 11 Febr. 1958, 1 ♀ Barham, 23 March 1960, M. I. Nikitin (BM). — South Australia, 2 ♀ Adelaide, coll. Drewsen (UZMC); 3 ♀ Adelaide (ML). — Western Australia, 1 ♀ Marloo Station, Durarga, April 1935, A. Goerling (ZMB); several specimens from Perth and other localities in Western Australia (WAM); 3 ♀ 3 ♂ Derby, April 1961 and March 1962, P. Slater (coll. Slater; ML); 2 ♂ Cardup Brook, Febr. 1963, G. F. Mees (ML).

In the British Museum this species is represented by specimens from New Guinea (Hollandia; Merauke), Solomon Is. (Malayta and Russel Island), and Australia (Queensland: Townsville, Mackay, and Toowoomba; Northern Territories: Darwin; Central Australia: Hermannsburg; Western Australia ("var." *cygnorum*: Yallingup; South Perth; Swan River; Yanchep). The Paris Museum possesses specimens from New Guinea (Yule Island) and Australia (Victoria).

Sceliphron laetum maindroni van der Vecht subsp. nov.

Pelopoeus laetus Smith; Maidron, 1878, Ann. Soc. ent. France (5) 8: 389, 394, Pl. 9, Fig. 1—7 (Ternate, Tidore; nesting habits).

♀ ♂ — Characterized by a reduction of the yellow markings. Band on pronotum as a rule interrupted medially. Markings on mesopleura and scutella slightly reduced in size. Propodeum either entirely black or only with traces of yellow spot at apex (in some males with two small yellow spots). Gastral petiole dark red above, fuscous to black at sides and below. First gastral tergite not entirely yellow: more than the basal half reddish to fuscous, apex with narrow black band which is widened medially. Legs hardly darker than in the typical form, but inner side of hind femora almost entirely black (in *laetum laetum* about the basal one fourth to one third red).

Ternate: 1 ♂ "Ter" (= Ternate, leg. Wallace) (OUM); 2 ♀ 1 ♂ Ternate, leg. Forsten (ML); 2 ♀ Bukunora, 50—100 m, 1 ♀ 3 ♂ Bukumenjiku, 75 m, 1 ♂ Ake Abdas, 1500 m, all Sept. 1951 (MZB; ML).

Halmahera: 1 ♀ Kau, sea level, Oct. 1951 (MZB), 2 ♀ Tolewang, Oct. 1951 (ML).

Obi: 7 ♀ Lake River, Kasowari, Anggai, and Laiwui, July-Nov. 1953, A. M. R. Wegner (MZB; ML).

Batjan: 1 ♀ "Bac" (= Batjan, leg. Wallace) (OUM).

The type is a female from Bukunora (ML), the other specimens recorded above are paratypes.

Tanimbar: A female collected in April 1938 by P. Buwalda on Pulu Jamdena is very similar to the specimens from the North Moluccas. The propodeum is black with small and faint reddish spots at apex, but the hind femora are more extensively red at base, the gastral petiole is entirely red, and the band on the pronotum is not interrupted. Two females from Tanimbar (MR) and five from Tanimbar Larat (NMW; 1 ♀ ML) have the same colour pattern.

Sceliphron (Sceliphron) fistularium (Dahlbom) (Fig. 1)

Pelopoeus fistularius Dahlbom, 1843, Hymen. Eur. 1: 23, ♀ ♂ — "Ad africae promont. bon. Sp.", leg. Thunberg: "Brasilia", leg. Erichson; 1845, do: 434 ("America").

Pelopoeus histrio Lepeletier, 1845, Hist. Nat. Ins. Hym. 3: 316, ♀ ♂ — Cayenne, coll. Serville (? loc.).

Sceliphron (*Pelopoeus*) *fistularium*; Kohl, 1918, Annln naturh. Mus. Wien 32: 97.

Sceliphron fistulare; Porter, 1926, Proc. U. S. nation. Mus. 70: 14; Richards, 1937, Trans. R. ent. Soc. Lond. 86: 105.

The species described from Cayenne by Lepeletier (1845) under the name *Pelopoeus bimaculatus* was placed by Kohl in the synonymy of *Sc. fistularium*. We agree with Porter (1926), however, that Lepeletier's description must have been based on a specimen of *Sc. figulum* (= *Sc. asiaticum* in the present paper).

Although *Pelopoeus histrio* was described by Lepeletier from the Serville collection, the type appears not to be in the Museum at Torino, where many types from this collection are preserved (see Bradley, 1957).

Mexico: 3 ♀ Omealca, Orizaba, M. Trujillo (BM; 1 ♀ ex coll. Cameron 1914-110).

Guatemala: 1 ♀ S. Geronimo, 1 ♀ Panzós, leg. Champion (BM).

Nicaragua: 1 ♂ Chontales, leg. Janson (BM).

Panama: 2 ♀ 1 ♂ Taboga, 1915—'16, Dr. Th. Mortensen (UZMC). — 1 ♀ San Lorenzo, Champion, ex coll. Cameron (BM).

Colombia: 3 ♀ Colombia, coll. Drewsen (UZMC); 1 ♀ Colombia, coll. Saunders (OUM); 1 ♀ 6 ♂ Cunaga Magd., March 1927, G. Salt (BM); 1 ♀ Andagoya, R. Condoto, Choco, H. G. F. Spurrell (BM; 1916-273); 1 ♀ Bogota (MBUD).

Gorgona Is.: 4 ♀ 7 ♂ July 1924, L. E. Cheesman (BM).

Venezuela: Merida (NMW); 1 ♂ La Trinidad, Maracay, July 1934, C. Vogl (ZMB).

Trinidad: 1 ♀ Guanapo, 20 Aug. 1929, D. C. Geijskes (ML).

British Guiana: 1 ♂ leg. Rodway (BM); "common on the coastal plain" (Richards, 1937); 1 ♀ Bartica, 8 April 1933, J. Ogilvie (BM).

Suriname: Paramaribo, 1 ♀ (MBUD), 1 ♀ Sept. 1957, P. H. van Doesburg Jr. (ML), 1 ♀ Jagtlust, 5 July 1938, D. C. Geijskes (MR); 1 ♀ Charlesburg, 29 April 1963, P. H. van Doesburg Jr. (ML); 2 ♀ 1 ♂ Zorg en Hoop, May 1963, from nest, J. van der Vecht (ML); 1 ♀ do., Sept. 1963, J. W. Broekhuizen (ML); 6 ♀ 1 ♂ Clevia, May and June 1963, P. H. van Doesburg Jr. and J. van der Vecht (ML); 4 ♀ Ma Retraite, swamp forest, in Malaise-trap, Jan.-March 1964, D. C. Geijskes (ML); 1 ♀ Kwatta, March 1964, D. C. Geijskes (ML). 2 ♀ Domburg, in Malaise-trap, Nov.-Dec. 1963, D. C. Geijskes (ML); 20 ♀ Republiek, in Malaise-trap, Sept.-Nov. 1963, D. C. Geijskes (ML); N.E. Suriname, 1 ♀ Moengatapoe-Wiawia, Oct. 1948, D. C. Geijskes (ML); 1 ♀ Zanderij, May 1961, P. H. van Doesburg Jr. (ML); 2 ♀ Mapane Area, Camp 8 LBB, 1 ♂ Auca on Suriname River, May 1963, J. van der Vecht (ML); 1 ♀ between Kabel and Brownsweg, 15 April 1965, G. F. Mees (ML); 2 ♀ Sara Creek, Soekoewatra, Dec. 1963, D. C. Geijskes (ML); 1 ♀ Bakhuis Mts., July 1963, R. van Aerde (ML); 7 ♀ Coeroeni, Upper Corantijn River, June 1963, J. G. Wessels Boer (ML); Wilhelmina Mts., 6 ♀ Kayser Airstrip, June 1963, 1 ♀ Lucie Camp, July 1963, H. Pijpers (ML).

Ecuador: 1 ♀ Cunalos, Jan. 1937, Dr. Schultze Rhonhof (ZMB).

Peru: 3 ♀ 1 ♂ Lima, Galatea Exp. (UZMC); 1 ♀ 1 ♂ Sullana, Hacienda Mallares, 10 Dec. 1957, W. Markl (NMB); 2 ♀ Satipo, 750 m, Jan. 1949, coll. Lindemans (MR); 2 ♀ Yurimaguas (MBUD); 19 ♀ 2 ♂ Dept. Loreto, Pucallpa, 1950—'65, throughout the year, J. M. Schuncke (BM; 1 ♂ ML).

Brazil: 4 ♀ 1 ♂ Brazil, from Mus. Berlin (ML); 1 ♀ Brazil, van Medenbach de Rooy (ML); 1 ♀ Brazil, from Westwood (ML); 2 ♀ Brazil, coll. Westermann (UZMC); 1 ♀ Amazonas,, 2 ♀ Pará, coll. Saunders (OUM); 3 ♀ Pará, Belem and Rio Acara, 1930, E. Horváth (MBUD); 2 ♀ Pará, 1931, G. Molnár (MBUD); 2 ♀ Manaus, Febr. 1896, E. E. Austen (BM); Amazon, 1 ♀ Rio Japura, 1 ♀ Manaus, leg. Roman (NRS), 1 ♀ Manaus, leg. Huebner (NRS); 4 ♀ Matto Grosso (NRS); 1 ♀ Recife, Pernambuco, Dec. 1934, Schubart (ZMB); 1 ♀ Rio de Janeiro, coll. Westermann, 3 ♀ Rio de Janeiro, leg. Friis (UZMC); 1 ♂ Corcorado, Rio de Janeiro, 20 May 1912, G. E. Bryant (BM); 1 ♀ Sta. Catarina (ML); 2 ♀ Sta. Catarina, H. Schulz, coll. Wüstnei (UZMC); 2 ♀ Blumenau, Sta. Catarina, 16 Nov. 1929, E. Wenzel (ZMB); 1 ♀ Blumenau (MBUD); 2 ♀ 2 ♂ Pelotas, 10 Dec. 1947 (NMW; BM); 1 ♀ do., 10 March 1966, C. M. Biezanko (BM).

Argentina: 1 ♀ Tucuman, coll. Saunders (OUM).

The collection of the Museum at Vienna (NMW) contains specimens from Venezuela (Merida), Suriname, Colombia, Ecuador, Bolivia, and Brazil (Rio Grande).

In the British Museum the senior author has seen a ♀ from the Cape Verde Is., S. Vincent, with label "imported" (no. 1916-273).

The U.S. National Museum possesses 1 ♀ 1 ♂ of this species with labels: "St. Vincent, W. I., H. H. Smith" and "*Sceliphron fasciatus* Lep." Apparently they form part of the series recorded under the latter name by Ashmead in 1900 (Trans. ent. Soc. Lond. 1900 : 308).

These specimen, kindly sent to me by Dr. Karl V. Krombein, differ from continental material in having the yellow markings on pronotum and propodeum distinctly reduced; in the male the dorsum of the propodeum is entirely black. Furthermore the hind legs are entirely black, except for a very small spot on each coxa in the male.

Postscript. — Recently, Dr. Arnold Menke (U.S. National Museum, Washington, D.C.) kindly drew my attention to the fact that two of the specific names used in this paper are invalid homonyms.

Sceliphron jamaicense (Fabr.), described in 1775 as *Sphex jamaicensis*, is preoccupied by *Vespa jamaicense* Drury, 1773, which has been recognized as a species of *Sphex* Linné. The name *Pelopoeus annulatus* Cresson, 1865, is available as a replacement name, and the species in question should henceforth be called *Sceliphron annulatum* (Cresson).

Sceliphron hemipterum (Fabr.), described in 1798 as *Sphex hemiptera*, is a junior homonym of *Sphex hemiptera* Scopoli, 1772 (Annus 5 : 122). It seems, however, that this latter species has generally been overlooked and that it cannot be identified with certainty. For this reason I hesitate to replace the well known name *hemipterum* (Fabr.) by the junior synonym *fuscum* Klug; if further investigations would indeed prove the name *Sphex hemiptera* Scopoli to be useless, I would prefer to see this name rejected by the International Commission on Zoological Nomenclature. — J. van der Vecht.

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